SONY

COLOR VIDEO CAMERA MODULE

XC-555
XC-555P

SERVICE MANUAL

1st Edition

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

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Manual Structure

Purpose of this manual

This manual is the Service Manual of the Color Video Camera Module XC-555/XC-555P.
This manual contains the service overview, operating description, adjustments, spare parts, semiconductor pin assignments, block diagrams, schematic diagrams and board layouts.

Related manuals

In addition to this Service Manual the following manual is provided.

- **Operating Instructions**
  Part No.: 3-206-581-01
  This manual describes the information required for the actual management and operation of this unit.

- **"Semiconductor Pin Assignments" CD-ROM (Available on request)**
  This "Semiconductor Pin Assignments" CD-ROM allows you to search for semiconductors used in B&P Company equipment.
  Semiconductors that cannot be searched for on this CD-ROM are listed in the service manual for the corresponding unit. The service manual contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.
  Part number: 9-968-546-XX

Trademarks

Trademarks and registered trademarks used in this manual are as follows.

- Windows is registered trademarks of Microsoft Corporation.
- IBM is registered trademarks of International Business Corporation.

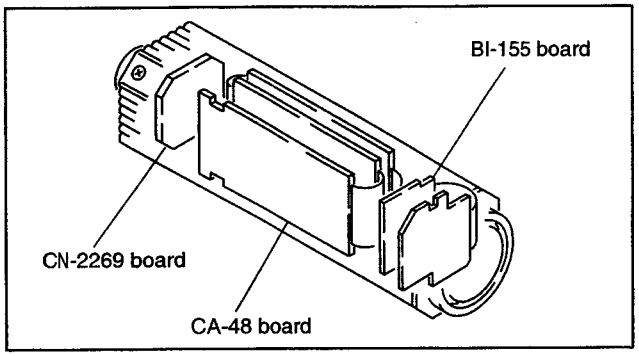
Section 1
Service Overview

Notes

When using the soldering iron for replacing and repairing parts, be sure to observe the following.
Incorrect use of the soldering iron may cause damage to the through hole on the board.

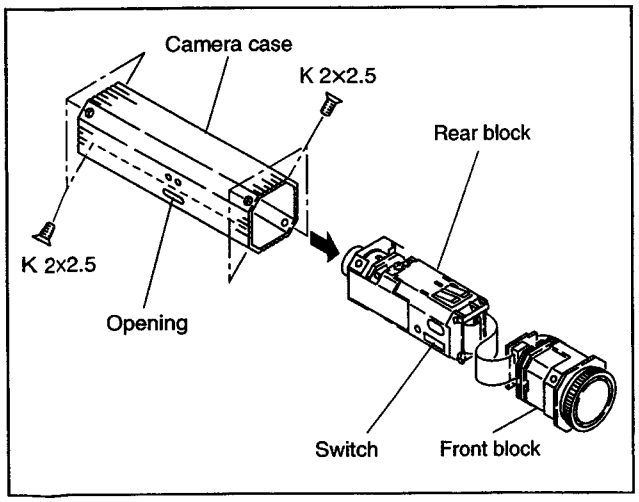
- Temperature of the tip of the soldering iron: 350°C or less
- Duration of applying heat: 5 seconds or less
- Solder: Lead-free

1-1. Board Location



1-2. Removal and Installation of Camera Case

1. Remove the seven screws, then pull out the front block and rear block.



2. Attach the camera case in the reverse order of step 1.

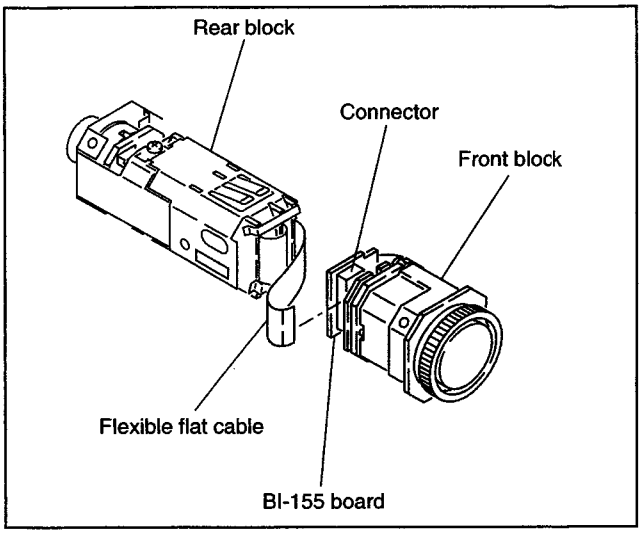
Note

When inserting the rear block into the camera case, make sure to align the switch of the rear block with the opening of the camera case.

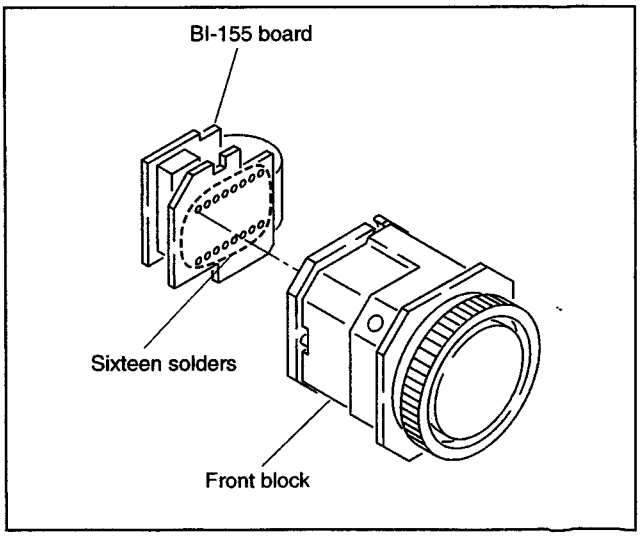
1-3. Removal and Installation of Board

1-3-1. BI-155 Board

1. Remove the camera case. (Refer to Section 1-2)
2. Disconnect one flexible flat cable from the connector on the BI-155 board, then remove the front block.



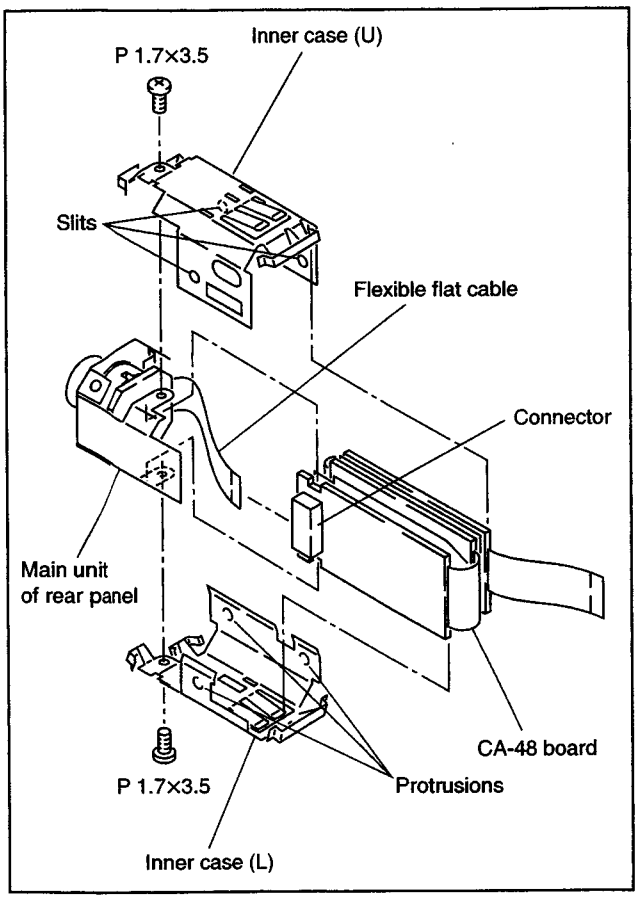
3. Remove the sixteen solders from the BI-155 board.



4. Attach the BI-155 board in the reverse order of steps 1 to 3.

1-3-2. CA-48 Board

1. Remove the camera case. (Refer to Section 1-2)
2. Remove the rear block. (Refer to Section 1-3-1)
3. Remove the two screws, then remove the main unit of rear panel.
4. Disconnect one flexible flat cable from the connector on the CA-48 board.
5. Remove the three protrusions, then remove the inner case (U) and inner case (L).



6. Attach the CA-48 board in the reverse order of steps 1 to 5.

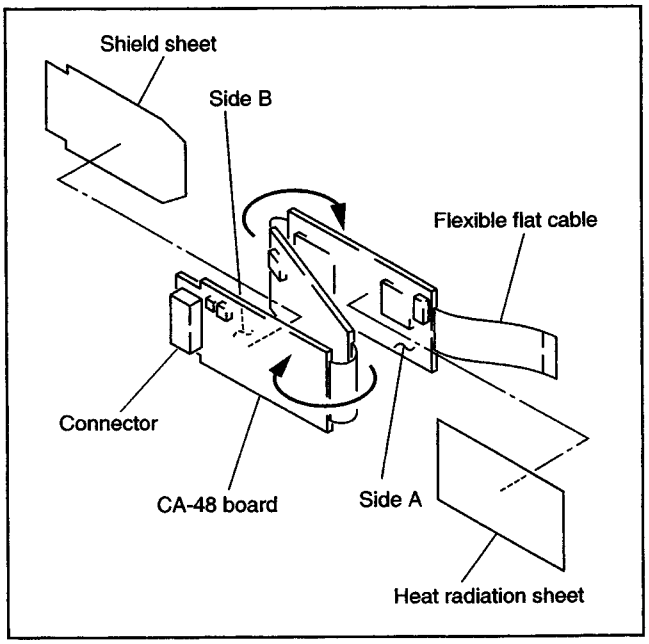
Precaution on replacing the CA-48 board

Removal

The heat radiation sheet (side A) and shield sheet (side B) attached on the CA-48 board are not prepared for spare parts. When replacing the CN-48 board, remove the two sheets from the board and keep them.

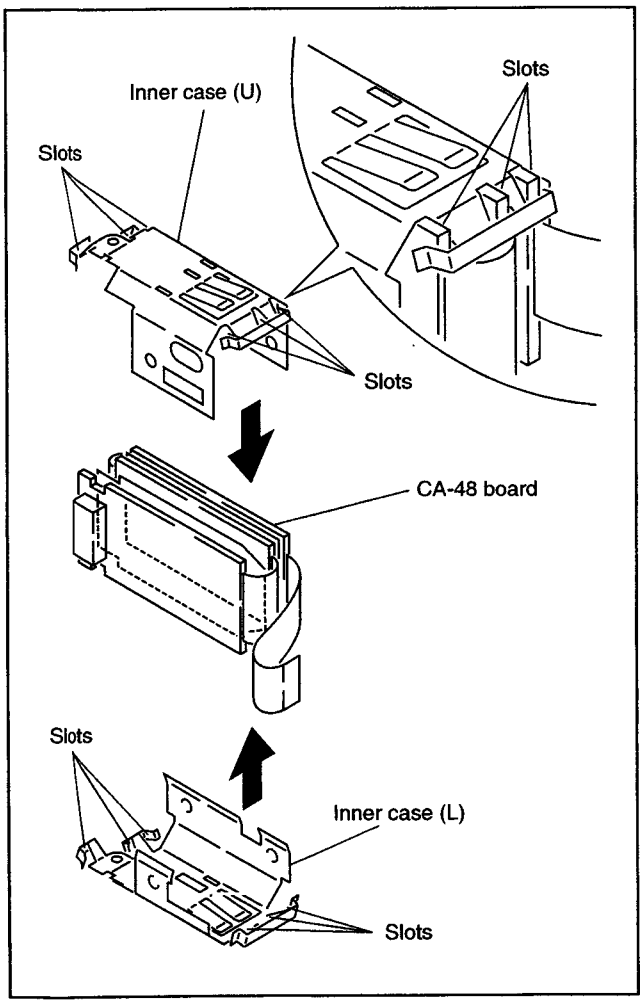
Installation

When attaching the CA-48 board, attach the heat radiation sheet on the side A and the shield sheet on the side B. Be careful in folding the board and not to pinch the flexible flat cable.



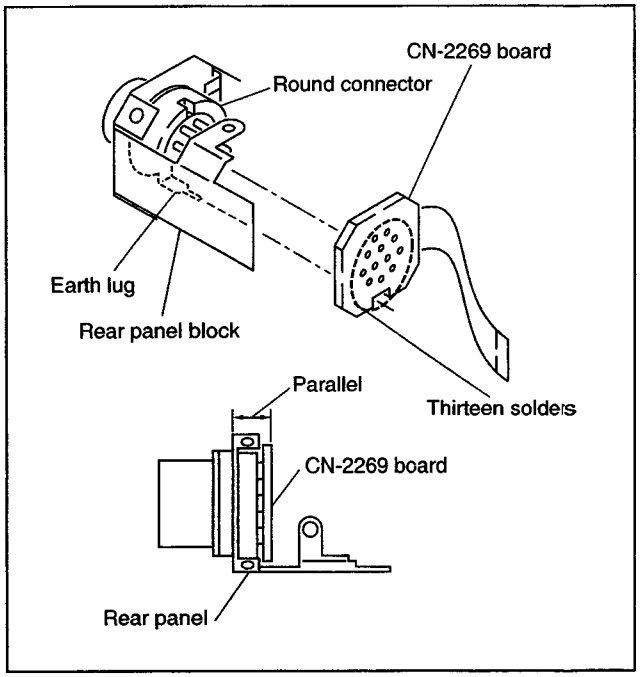
Note

When attaching the inner case (U) and inner case (L), align the CA-48 board with the six slots of the inner case (U) and six slots of the inner case (L).



1-3-3. CN-2269 Board

1. Remove the camera case. (Refer to Section 1-2)
2. Remove the main unit of rear panel. (Refer to Section 1-3-2)
3. Remove the thirteen solders (twelve round connectors and one earth lug), then remove the CN-2269 board.



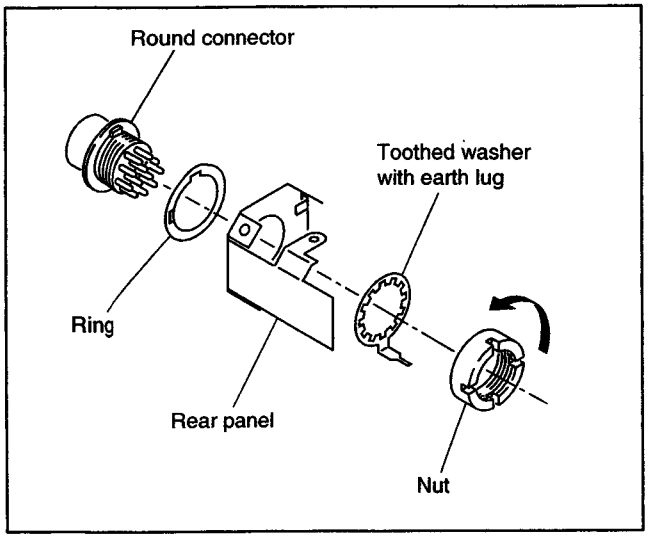
4. Attach the CN-2269 board in the reverse order of steps 1 to 3.

Note

When attaching the CN-2269 board, solde it in parallel with the rear panel.

1-4. Removal and Installation of Round Connector

1. Remove the camera case. (Refer to Section 1-2)
2. Remove the main unit of rear panel. (Refer to Section 1-3-2)
3. Remove the CN-2269 board. (Refer to Section 1-3-3)
4. Turn the nut in the direction indicated by the arrow, then remove the toothed washer with earth lug, ring, round connector from the rear panel.



5. Attach the round connector in the reverse order of steps 1 to 4.

1-5. Specifications

Pickup device

Pickup device	Interline transfer 1/2-type CCD
Color filter	Complementary color mosaic
Total picture elements	XC-555: 768 (H) × 494 (V) XC-555P: 752 (H) × 582 (V)

Optical and others

Lens mount	Special mount (NF mount)
Signal system	XC-555: NTSC standard XC-555P: PAL standard
Scanning system	XC-555: 525 lines, 2:1interlace, 30 frames/sec. XC-555P: 625 lines, 2:1interlace, 25 frames/sec.
Sync system	Internal/External (automatic switching)
External synchronous input	HD/VD, VS
Horizontal resolution	XC-555: 470 TV lines XC-555P: 460 TV lines
Minimum illumination	3 lux at F1.2 AGC: ON
Sensitivity	2000 lux at F8 AGC: OFF (0 dB)
Video output	VBS/Y/C (selected with the switch) VBS: 1 V p-p, 75 Ω, sync negative Y: 1 V p-p, 75 Ω C: C level depends on the composite video out signal
Video signal to noise ratio	XC-555: 48 dB (standard) AGC: OFF (0 dB) XC-555P: 46 dB (standard) AGC: OFF (0 dB)
Shutter speed	4 speeds selectable: 1/60 sec. (OFF) (NTSC)/1/50 sec. (OFF) (PAL), 1/1000 sec., CCD IRIS, and FLICKERLESS
White Balance	4 modes selectable: ATW (auto white tracing balance), 3200K, 5600K, and MAN (manual)
Gain control	2 modes selectable: AGC and fixed (0 dB)
Output connect	DC IN/SYNC/VIDEO: multi 12-pin
Power requirement	10.5 to 15 V DC
Power consumption	2.4 W

Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	−30 °C to 60 °C (−22 °F to 140 °F)
Operating humidity	20 to 80% (no condensation permissible)
Storage humidity	20 to 90% (no condensation permissible)
Shock resistance	70 G
Dimensions	22 × 22 × 75 (mm) (w/h/d) (7/8 × 7/8 × 2 15/16 inches)
Mass	60 g (2 oz)
Accessories supplied	Lens mount cap (1) Tripod adaptor (1 set) Operating Instructions (1)

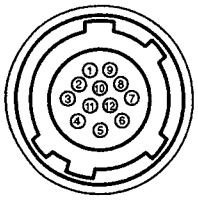
Accessories not supplied

Camera adaptor	DC-700/DC-700CE
Special mount lens	VCL-12S12XM (f = 12 mm) VCL-06S12XM (f = 6 mm) VCL-03S12XM (f = 3.5 mm) VCL-12SSXM (f = 12 mm)
C-mount Adaptor	LO-999CMT
Extension ring kit	LO-999ERK
12-pin camera cable	CCXC-12P02N/12P05N/ 12P10N/12P25N

Design and specifications are subject to change without notice.

1-6. Connector and Pin Assignment

DC IN/SYNC/VIDEO connector (multi 12-pin)



Pin No.	External Sync signal		Internal Sync signal
	HD,VD	VS Input	
1	GND	GND	GND
2	+12V	+12V	+12V
3	VBS/Y Output (GND)	VBS/Y Output (GND)	VBS/Y Output (GND)
4	VBS/Y Output (signal)	VBS/Y Output (signal)	VBS/Y Output (signal)
5	HD Input (GND)	—	—
6	HD Input (signal)	—	—
7	VD Input (signal)	VS Input (signal)	—
8	GND (–/C)	GND (–/C)	GND (–/C)
9	–/C Output (signal)	–/C Output (signal)	–/C Output (signal)
10		RS-232C (TXD)*	
11		RS-232C (RXD)*	
12	VD Input (GND)	VS Input (GND)	

* The RS-232C switch is set to OFF at the factory
For details on how to change this setting, please refer to the Technical Manual.

Section 2
Operating Description

2-1. BI-155 Board

Output signal (pin 8 of IC1101) from the CCD imager (IC1101) is supplied to the CA-48 board via pin 9 of CN1101 after passed through the buffer (Q1101). Each pulses of H1 and H2, and V1 to V4, RG and SUB are activated for CCD driving, that are supplied from the CA-48 board.

2-2. CA-48 Board

Main signal processing circuit
CCD-OUT signal (pin 9 of CN101) from the BI-155 board is sent to pins 25 and 26 of IC101, and is performed the CDS (Correlative Double-sampling) processing. And more, it is amplified in the AGC circuit, and CCD-OUT signal is output from pin 8 of IC101. The output signal is then supplied to pin 39 of IC103, and is converted to A/D conversion.
10 bit data (pins 1 to 5, and 8 to 12 of IC103) of the A/D output is supplied to the DSP CORE signal processing circuit (pins 85 to 94 of IC107). It also D/A conversion after digital signal processing into IC107, and are obtained the analog Y/C output signals (Y at pin 20 and C at pin 21 of IC107). The Y/C output signals are mixed after passed through of each filters (FL301 for Y, FL302 for C), then is output from pin 4 of CN301 passes through amplifier (IC302) when No.1 of switch S302 is set to ON. When No.1 of switch S302 is set to OFF, Y signal is output from pin 4 of CN301 and C signal is output from pin 10 of CN301 passes through the amplifier (IC304) separately.

Microprocessor peripheral circuit
Microprocessor (IC204) performs the every parameter setting of the digital signal processing circuit (IC107), some data of them are stored in E2PROM (IC206).
Regarding of the analog data control, it performs the digital controlling by the microprocessor command through the D/A converter (IC203).
DSP parameter is formed of changing by RS232C communication through the receiver (IC207).

CCD drive pulse signal circuit
The TG (IC104) that is input the main clock at 28 MHz, are generated the CCD drive pulse and sampling hold pulse. The synchronizing signal required for TG is obtained from the synchronizing signal generation block in IC107.

External synchronous circuit

VS

This circuit forms the Vreset/H-PLL that the synchronizing source VS signal from pin 8 of CN301 is supplied to pin 60 of IC107. The VCO (X101) frequency for inner master controls by DC voltage passes through LPF of IC106 peripheral circuit using this H phase comparison output (pin 63 of IC107).

HD/VD

HD and VD external synchronous realizes that the synchronizing source HD signal from pin 6 of CN301 is supplied to pin 60 of IC107 and the synchronizing source VD signal from pin 8 of CN301 is supplied to pin 61 of IC107.
Automatic discrimination of the external synchronizing signal input performs according that VD signal is synchronous detected from IC214 and HD signal is synchronous detected from IC211, R221 and C227, and then send them to the microprocessor.

Power supply circuit

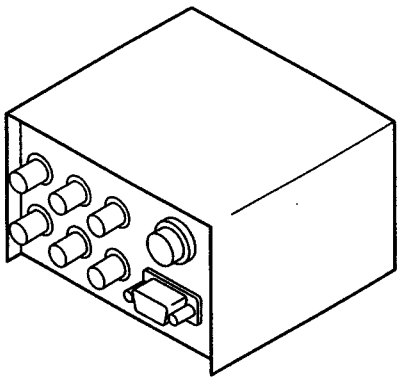
External DC12 V is supplied to the DC-DC converter (DD301) through the CCXC camera cables, four voltages (3.3 V, 5 V, −9.1 V and 15 V) generate in the DC-DC converter and send them to each circuit.

Section 3
Adjustments

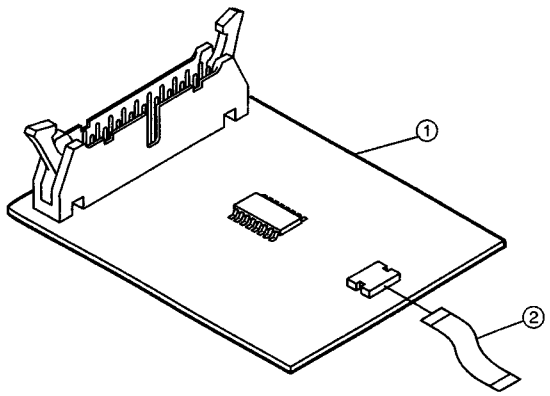
3-1. Preparation

3-1-1. Equipment Required

J-6432-760-A	Adjustment JB tool

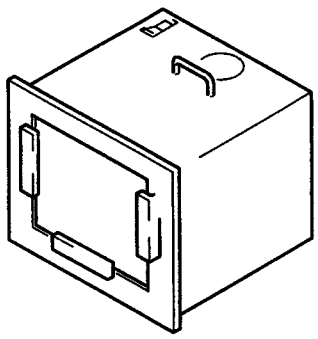


J-6432-710-A	①Microprocessor writing tool board
J-6432-720-A	②Extension cable for microprocessor writing

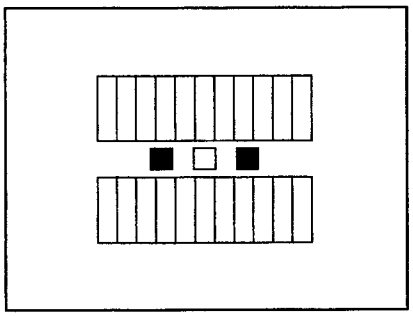


J-6029-140-B	Pattern box (For PTB-500)
J-6431-850-A	Pattern box (For PTB-700)

Light Source for Test Chart

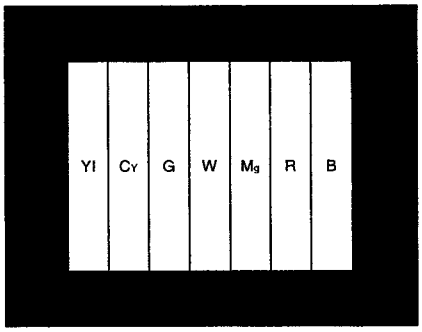


J-6026-130-B	Gray scale chart (For PTB-500)
J-6027-070-A	Gray scale chart (For PTB-700)



J-6020-250-A	Color bar chart (For PTB-500)
J-6027-100-A	Color bar chart (For PTB-700)

For Color Reproduction Adjustment



Equipment Table

- CCXC-12P02N cable (2m)
- +12V DC power supply
- IBM-PC personal computer (describes below to PC) system or equivalent: Windows98 and later models
- D-SUB9P/D-SUB9P crosses cable: CCX-9DD
- D-SUB25P/D-SUB9P straight cable
- FLASH2 system (Hokuto Electronics)
- Adjustment software (XC555.exe) Sony part No.: J-6432-730-A
- Writing data Sony part No.: J-6432-740-A
- C14 filter Sony part No.: J-6080-058-A
- Waveform monitor
- Frequency counter
- Color monitor
- Vectorscope
- C mount lens VCL-16Y-M
- C mount adapter LO-999CMT
- Camera holder (A) assembly Sony part No.: X-3166-471-3
- Camera holder (B) assembly Sony part No.: X-3166-472-1
- Camera holder (A) and (B) assemblies installation screw Sony part No.: 3-174-632-01
- Vectorscope scale

3-1-2. Installing the Application Software

1. Installing of FLASH2 (P2win.exe)

(1) Insert the supplied CD-ROM to the PC, double-click the setup.exe.
(2) When exit the setup.exe, "FLASH2 for Windows" icon appears on the screen. Double-click the "FLASH2 for Windows" icon to start up the P2win.exe.
(3) Select the display language from the "Language" menu. (The following description shows when language is selected to English.)
(4) Select "H8/3664" from the "CPU Type" on the "Set" menu and click "OK" button.
(5) Set "Communication" on the "Set" menu as describes in below, click "OK" button after setting is completed.

Transfer rate in boot-mode:	9600bps
Max transfer rate:	38400bps
Communication port:	Select the FLASH2 connecting port

(6) Select "Comparing by check sum of only Blocks writing is carried out" from "Verify" on the "Set" menu, then click OK button.
(7) Set "Terminal State" on the "Set" menu as describes in below, click "OK" button after setting is completed.

MD 0: Low
MD 1: High-Z
I/O 0: High
I/O 1: High-Z
I/O 2: High-Z
FWE: Low

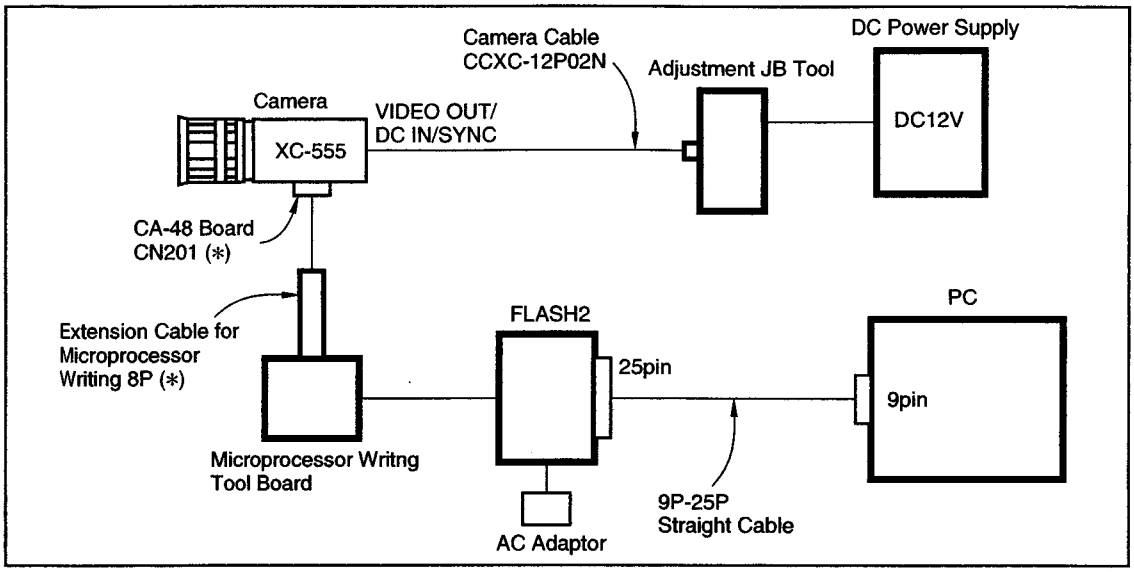
(8) Exit the P2win.exe.

2. Installing of Adjustment Software (XC555.exe)

(1) Copy the XC555.exe software to the hard disk of the PC.
(2) Start up the XC555.exe.
(3) Alert message "Communication error" appears on the screen by reason of disconnecting the camera, but click "OK" button in disregard of the alert message.
(4) Select the serial port for using the adjustment, that connect to the adjustment JB tool board using D-SUB9P crosses cable, from "Setup" menu.
(5) Exit the XC555.exe.

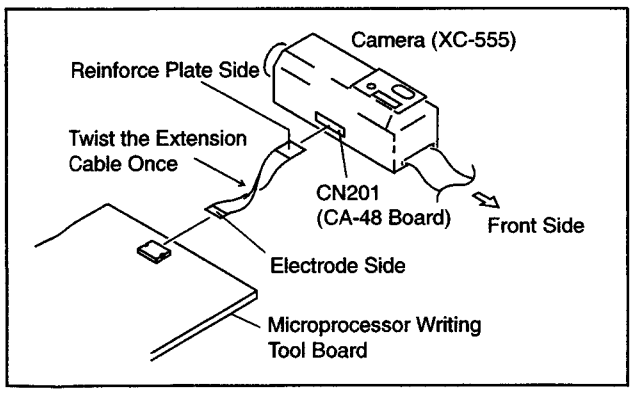
3-1-3. Connections

1. Connection for updating of FLASH microprocessor software.

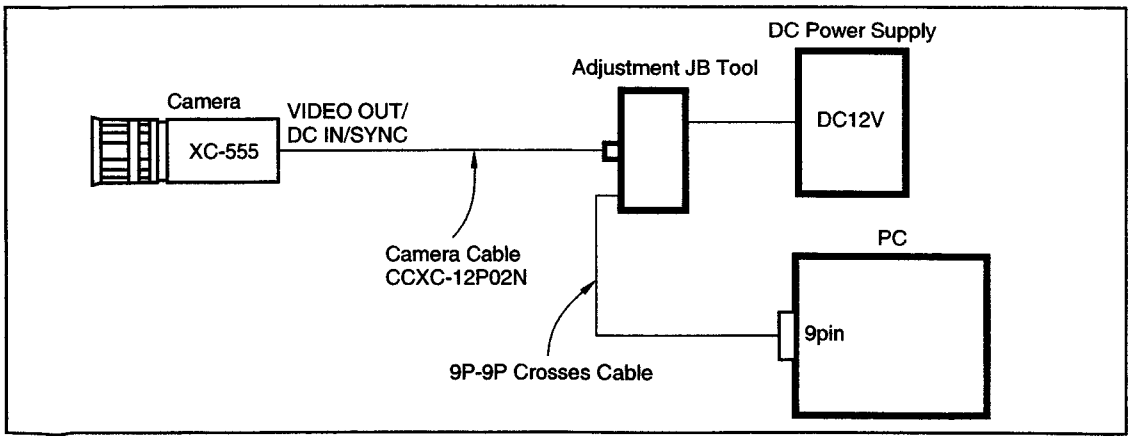


Note

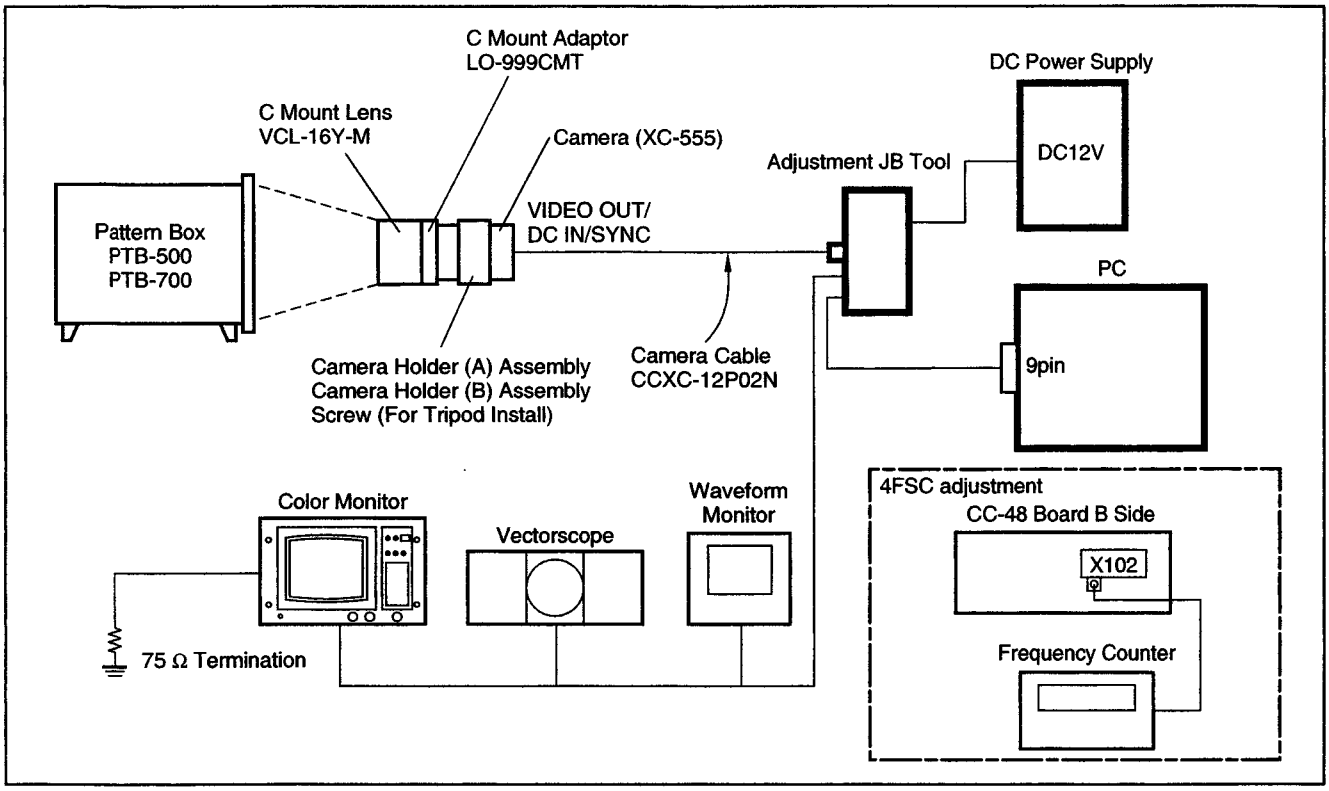
When connect CN201 (CA-48 board) of the camera to the microprocessor writing tool board, twist the extension cable for microprocessor writing once first.
Then connect the cable as shown in figure.



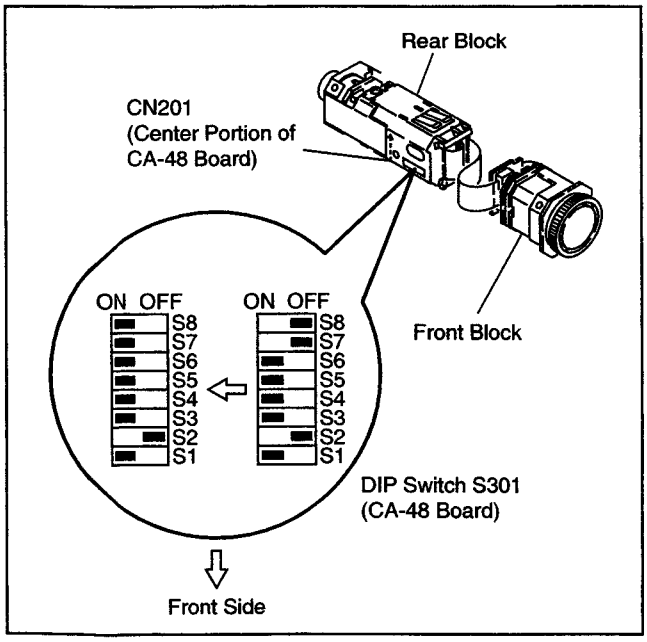
2. Connection for EEPROM initializing



3. Connection for adjustment



4. DIP switch S301 setting and CN201 connection (CA-48 board)



Note

When a RS-232C port is used in common between FLASH2 (P2win.exe) and adjustment software (XC555.exe), do not start up of both software at a same time, to prevent the contention of using a RS-232C port.

3-1-4. Microprocessor Programming

1. Software Updates Performing State for FLASH Microprocessor

When replace the microprocessor IC (IC204) or CA-48 board, make sure performing the software updates.

2. Operating the FLASH2

(1) Remove the camera case of the unit. (Refer to Section 1-2)
(2) Connect the camera that pins 7 and 8 of DIP switch (S301: CA-48 board) are set to OFF, to FLASH2. And supply the power to the FLASH2.
(3) Start up the F2win.exe.
(4) Select the writing data file (Extension: .mot) from "Open" on the "File" menu.
(5) Insert the 8-pin flexible cable on the writing tool board for microprocessor to the CN201 on the CA-48 board.
(6) Turn on the power (DC +12 V) of the camera.
(7) Select "Exec Write" on the "Write" menu to start the software updates of the microprocessor.
(8) When "Complete" appears on the screen, click OK button to complete the updates.
(9) After turn off the power of the camera and FLASH2, disconnect the camera from FLASH2.

Note

After performing the software updates of the FLASH microprocessor, it is require for EEPROM initialization. For EEPROM initialization, refer to the following Section 3-2-2.

3-2. Overall Adjustment

1. Operating the Adjustment Software

(1) Connect the camera that pins 7 and 8 of DIPswitch (S301: CA-48 board) are set to ON, to the adjustment JB board. And then turn on the power of the camera.
(2) Start up the adjustment software (XC555.exe). In case of "Communication error" appears on the screen, click "OK" button to exit the XC555.exe once. Then start up the XC555.exe again.
(3) Select "Adjust" on the "Window" menu. Enter the password hito7320508 and click OK button, control panel for adjustment is indicated on the screen.

2. Initializing the EEPROM

(1) Set the color system to NTSC or PAL.
(2) Select 0x0A from the "EPROM Address" in the combo box, set the following value using slide bar "EPROM data".

NTSC: 4E (Hex)
PAL: 50 (Hex)

(3) Click Init button to appear the "Initialize All EPROM data", then click OK button. After the several seconds, disappear the sandglass cursor and reappear the slide bars. Then EEPROM initialize is completed.

Note

Perform the steps in Sections 3-2.1 and 3-2.2 sequentially. Do not turn off the power of camera or end the adjustment software in the course of adjustment.

(4) Click Reset button.

3. Initializing the EEPROM using the File (Extension: .epd)

Note

This initialize procedure performs the overwriting on the EEPROM only, but not overwriting on the Flash microprocessor.

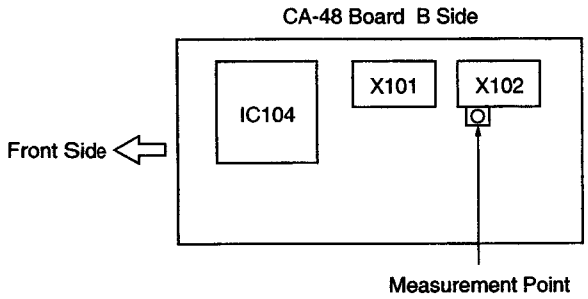
(1) Copy the EEPROM data file (Extension: .epd) to the hard disk on PC previously.
(2) Indicate the control panel for adjustment by reference of Section 3-2-1 "Operating the Adjustment Software".
(3) Click the "Load" button, select the rewriting file (Extension: .epd).
(4) After the several seconds, disappear the hourglass cursor. Then EEPROM initialize is completed.
(5) After exit the adjustment software XC555.exe and turn off the power of the camera, then remove the connections of the camera. After that, set pins 7 and 8 of the DIP switch (S301: CA-48 board) to OFF positions.

3-3. Adjustments

1. 4FSC Adjustment

Subject:	Not required (lens closed)
Measurement Point:	X102 (CA-48 board)
Measuring Instrument:	Frequency counter
Adjustment Point:	Slide bar "EPROM data"
Specifications:	NTSC: 14.31818 ±10 Hz
	PAL: 17.734475 ±10 Hz

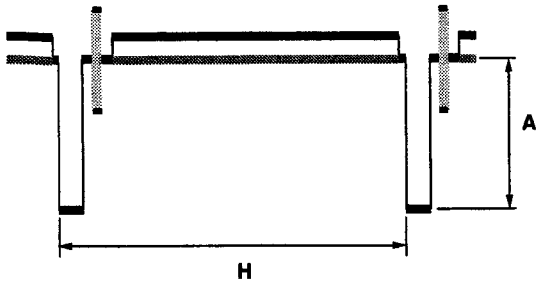
(1) Connect the probe of the frequency counter to measurement point of X102 on the CA-48 board. (Refer to following figure.)
(2) Select 0x05 of the "EPROM Address" on the combo box, adjust slide bar "EPROM data" so that the frequency of the frequency counter is satisfied within specifications.



2. Sync Level Adjustment

Subject:	Not required (lens closed)
Measurement Point:	VIDEO OUT
Measuring Instrument:	Waveform monitor
Adjustment Point:	Slide bar "Sync Level"
Specifications:	A = 40 ±2 IRE (NTSC)
	A = 300 ±15 mV (PAL)

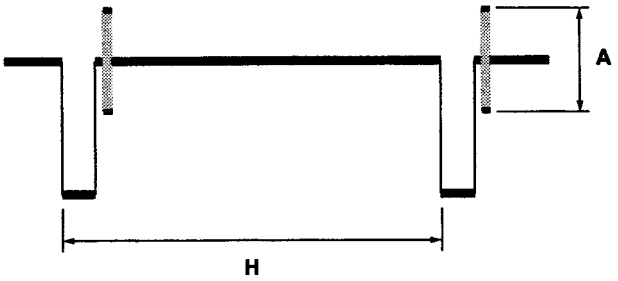
(1) Adjust slide bar "Sync Level" so that the Sync level of the waveform monitor is satisfied within specifications A.



3. Burst Level Adjustment

Subject:	Not required (lens closed)
Measurement Point:	VIDEO OUT
Measuring Instrument:	Vectorscope
Adjustment Point:	Slide bar "Burst Level"
Specifications:	A = 40 ±2 IRE (NTSC)
	A = 300 ±15 mV (PAL)

(1) Adjust slide bar "Burst Level" so that the Burst level of the vectorscope is satisfied within specifications A.



4. Setup Level Adjustment

Subject:	All black
Measurement Point:	VIDEO OUT
Measuring Instrument:	Waveform monitor
Adjustment Point:	Slide bar "Setup"
Specifications:	NTSC: 5 ±2 IRE
	PAL: 35 ±15 mV

(1) Cover with black cap to the lens to set to all black, adjust slide bar "Setup" so that the Setup level of the waveform monitor is satisfied within specifications.
(2) After completing the adjustment, remove the black cap of the lens.

5. AGC 0dB Adjustment

Subject:	Gray scale chart
Measurement Point:	VIDEO OUT
Measuring Instrument:	Waveform monitor
Adjustment Point:	Lens iris
Specification:	All white 100%

(1) Confirm the radio button is selected to 0dB.
(2) Attach the gray scale chart to the pattern box, shoot the images of the gray scale chart. Adjust lens iris so that the white level of the waveform monitor becomes all white at 100%.

6. AGC 6dB Adjustment

Subject:	Gray scale chart
Measurement Point:	VIDEO OUT
Measuring Instrument:	Waveform monitor
Adjustment Point:	Slide bar "Gain"
Specification:	All white 100%

(1) Select the radio button to 6dB, adjust slide bar "Gain" so that the white level of the waveform monitor becomes all white at 100%.

Note

Be sure click the "Gain" part after change the gain of the radio button. If not click the "Gain" part, the gain is not changed.

7. AGC 12dB Adjustment

Subject:	Gray scale chart
Measurement Point:	VIDEO OUT
Measuring Instrument:	Waveform monitor
Adjustment Point:	Slide bar "Gain"
Specification:	All white 100%

(1) Select the radio button to 12dB, adjust slide bar "Gain" so that the white level of the waveform monitor becomes all white at 100%.

Note

Be sure click the "Gain" part after change the gain of the radio button. If not click the "Gain" part, the gain is not changed.

8. AGC 18dB Adjustment

Subject:	Gray scale chart
Measurement Point:	VIDEO OUT
Measuring Instrument:	Waveform monitor
Adjustment Point:	Slide bar "Gain"
Specification:	All white 100%

(1) Select the radio button to 18dB, adjust slide bar "Gain" so that the white level of the waveform monitor becomes all white at 100%.
(2) After completing the adjustment, select the radio button to 0dB.

Note

Be sure click the "Gain" part after change the gain of the radio button. If not, click the "Gain" part. The gain is not changed.

9. R-Gain and B-Gain Adjustments (3200K)

Subject:	Gray scale chart
Measurement Point:	VIDEO OUT
Measuring Instrument:	Waveform monitor
Adjustment Point:	Slide bars "R-Gain", "B-Gain"

(1) Confirm the radio button is selected to "3200K".
(2) Attach the gray scale chart to the pattern box, shoot the images of the gray scale chart. Adjust lens iris so that the white level of the waveform monitor becomes all white at 100%.
(3) Adjust slide bars "R-Gain" and "B-Gain" so that luminance point on the vectorscope becomes at the center position.

10. R-Gain and B-Gain Adjustments (5600K)

Subject:	Gray scale chart
Filter:	C14 filter
Measurement Point:	VIDEO OUT
Measuring Instrument:	Waveform monitor
Adjustment Point:	Slide bars "R-Gain", "B-Gain"

(1) Attach the C14 filter to the camera.
(2) Select the radio button to "5600K".
(3) Attach the gray scale chart to the patter box, shoot the images of the gray scale chart. Adjust lens iris so that the white level of the waveform monitor becomes all white at 100%.
(4) Adjust slide bars "R-Gain" and "B-Gain" so that luminance point on the vectorscope becomes at the center position.
(5) After completing the adjustment, remove the C14 filter and then select the radio button to "3200K".

11. Color Reproduction Adjustment

Subject:	Color bar chart
Measurement Point:	VIDEO OUT
Measuring Instrument:	Waveform monitor
Adjustment Point:	Slide bars "RY Gain-1", "BY Gain-1", "RY Hue-1", "BY Hue-2"

(1) Confirm the radio button is selected to "3200K".
(2) Attach the color bar chart to the pattern box, shoot the images of the color bar chart. Adjust lens iris so that the white level of the waveform monitor becomes all white at 100%.
(3) Select the radio button to Color ADJ "Bind".
(4) Adjust slide bars "RY Gain-1", "BY Gain-1", "RY Hue-1" and "BY Hue-1" so that all color luminance points on the vectorscope are settle within each color reproduction frame.
(5) After completing the adjustment, exit the adjustment software XC555.exe and turn off the power of the camera first, then remove the connections. After that, set pins 2, 7 and 8 on the DIP switch (S301: CA-48 board) to OFF positions.

Section 4
Spare Parts

4-1. Notes on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

3. Stock of Parts

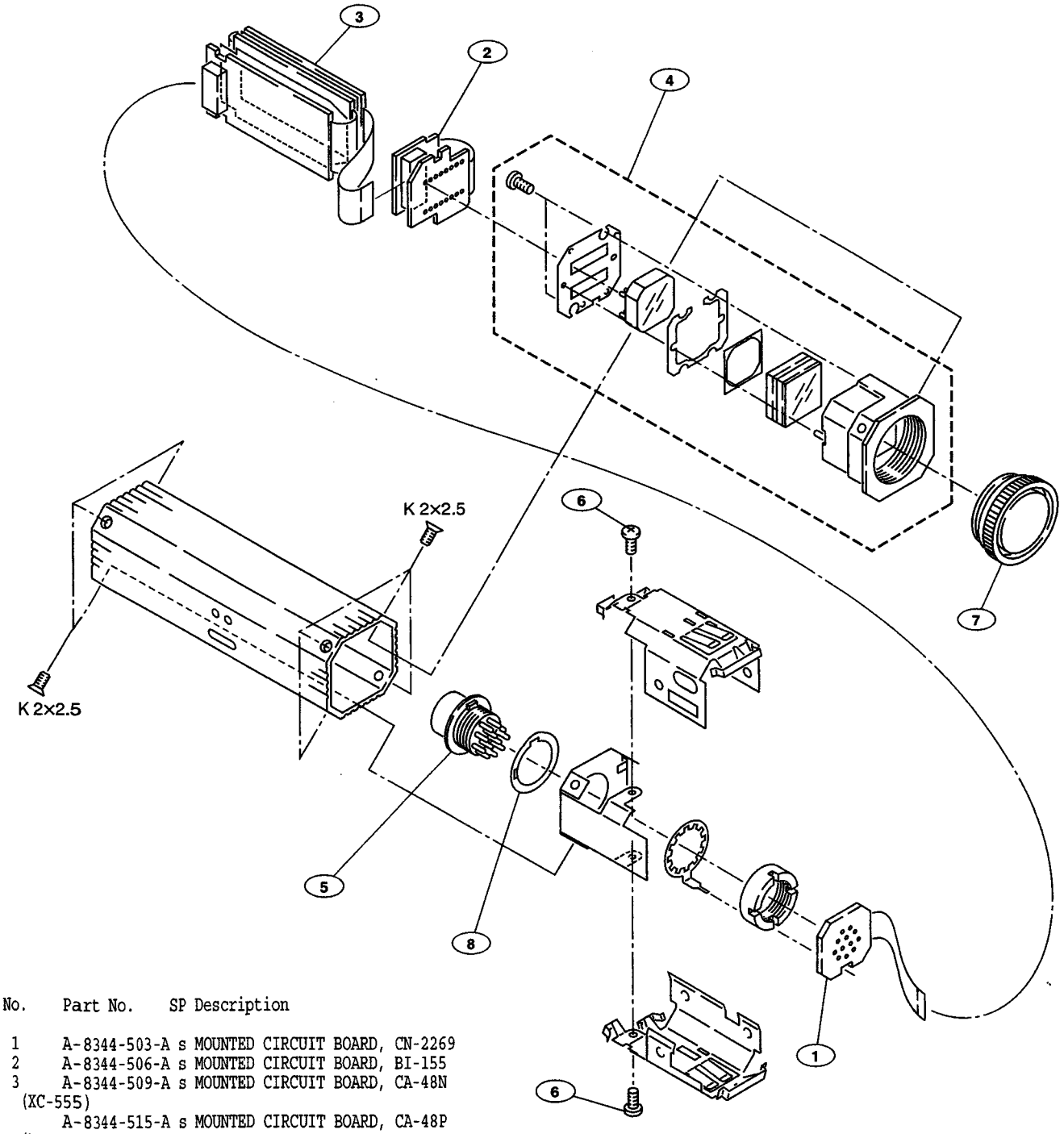
Parts marked with "o" at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

Notes

When using the soldering iron for replacing and repairing parts, be sure to observe the following.
Incorrect use of the soldering iron may cause damage to the through hole on the board.

- Temperature of the tip of the soldering iron: 350°C or less
- Duration of applying heat: 5 seconds or less
- Solder: Lead-free

4-2. Exploded Views



No.	Part No.	SP	Description
1	A-8344-503-A	s	MOUNTED CIRCUIT BOARD, CN-2269
2	A-8344-506-A	s	MOUNTED CIRCUIT BOARD, BI-155
3	A-8344-509-A	s	MOUNTED CIRCUIT BOARD, CA-48N (XC-555)
	A-8344-515-A	s	MOUNTED CIRCUIT BOARD, CA-48P (XC-555P)
4	A-8344-699-A	s	ASSY, FRONT PANEL (RP) (XC-555)
	A-8344-700-A	s	ASSY, FRONT PANEL (RP) (XC-555P)
5	1-691-410-21	s	CONNECTOR, ROUND TYPE 12P
6	3-056-030-41	s	SCREW +P1.7X3.5
7	3-173-508-01	s	CAP (SPECIAL MT), LENS MOUNT
8	3-623-104-02	s	RING
	7-627-452-48	s	SCREW +K2X2.5

4-3. Electrical Parts List

BI-155 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8344-506-A	s	MOUNTED CIRCUIT BOARD, BI-155
C1103	1-164-937-11	s	CAPACITOR,CHIP CERAMIC 1000PF
C1104	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C1105	1-135-212-21	s	CAPACITOR TANTALUM 2.2MF/35V
C1106	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C1107	1-135-212-21	s	CAPACITOR TANTALUM 2.2MF/35V
C1110	1-131-861-11	s	CAPACITOR,TANTALUM ELECT 4.7MF
C1111	1-131-861-11	s	CAPACITOR,TANTALUM ELECT 4.7MF
C1112	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C1113	1-135-212-21	s	CAPACITOR TANTALUM 2.2MF/35V
CN1101	1-778-165-21	s	CONNECTOR, FFC/FPC (ZIF) 17P
L1101	1-469-058-11	s	INDUCTOR 22UH
L1102	1-469-058-11	s	INDUCTOR 22UH
Q1102	8-729-012-35	s	TRANSISTOR 2SK711-BL
R1103	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R1104	1-218-941-11	s	RESISTOR,CHIP 100 1/16W (1005)
TP1101	1-535-757-11	s	CHIP, CHECKER (CONNECTOR)

CA-48 BOARD

*1:XC-555
*2:XC-555P

Ref. No. or Q'ty	Part No.	SP	Description
1pc *1	A-8344-509-A	s	MOUNTED CIRCUIT BOARD, CA-48N
1pc *2	A-8344-515-A	s	MOUNTED CIRCUIT BOARD, CA-48P
C101	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C102	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C103	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C104	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C105	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C106	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C107	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C108	1-107-689-21	s	CAPACITOR,TANTALUM 1MF/35V
C109	1-107-689-21	s	CAPACITOR,TANTALUM 1MF/35V
C110	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C111	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C112	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C115	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C116	1-127-715-11	s	CAPACITOR,CERAMIC 0.22MF B1608
C117	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C118	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C119	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C120	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C121	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C122	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C123	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C124	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C125	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C126	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C127	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C128	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C129	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C130	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C131	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C132	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C133	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C134	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C135	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C136	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C137	1-135-212-21	s	CAPACITOR TANTALUM 2.2MF/35V
C138	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C139	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C140	1-128-694-11	s	CAP, CHIP TANTALUM ELECT 22MF
C141	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C142	1-113-985-11	s	CAPACITOR,TANTALUM 10MF/20V
C143	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C144	1-104-920-11	s	CAPACITOR TANTALUM 4.7MF/35V
C145	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C146	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C147	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C148	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C149	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C150	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C151	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C152	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C153	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C154	1-107-689-21	s	CAPACITOR,TANTALUM 1MF/35V
C155	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C156	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V

(CA-48 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C157	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C159	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C160	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C161	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C162	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C163	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C164	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C165	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C166	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C167	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C168	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C169	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C173	1-128-694-11	s	CAP, CHIP TANTALUM ELECT 22MF
C174	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C175	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C176	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C177	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C178	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C179	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C180	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C201	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C202	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C205	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C206	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C207	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C209	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C210	1-164-852-11	s	CAPACITOR,CHIP CERAMIC 12PF/16
C211	1-164-852-11	s	CAPACITOR,CHIP CERAMIC 12PF/16
C212	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C213	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C214	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C215	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C216	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C217	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C218	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C219	1-125-839-11	s	CAPACITOR,TANTALUM 47MF/6.3V
C220	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C221	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C222	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C226	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C227	1-107-820-11	s	CAPACITOR,CHIP CERAMIC 0.1MF F
C228	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C229	1-164-874-11	s	CAPACITOR,CHIP CERAMIC 100PF
C230	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C232	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C233	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C234	1-128-694-11	s	CAP, CHIP TANTALUM ELECT 22MF
C235	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C236	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C237	1-164-937-11	s	CAPACITOR,CHIP CERAMIC 1000PF
C238	1-164-004-11	s	CAPACITOR,CERAMIC 0.1MF/25V
C239	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C302	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C303	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C304	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C305	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C306	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C307	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C308	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V

(CA-48 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C309	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C310	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C311	1-164-935-11	s	CAPACITOR,CHIP CERAMIC 470PF
C312	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C313	1-137-700-11	s	CAPACITOR, C.TANTALUM 10MF
C314	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C315	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C316	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C317	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C318	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C319	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C320	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C321	1-128-964-11	s	CAPACITOR,TANTALUM 100MF/6.3V
C322	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C323	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C324	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C325	1-137-934-11	s	CAPACITOR, CHIP TANTALUM 47MF
C326	1-113-985-11	s	CAPACITOR,TANTALUM 10MF/20V
C327	1-135-212-21	s	CAPACITOR TANTALUM 2.2MF/35V
C328	1-135-212-21	s	CAPACITOR TANTALUM 2.2MF/35V
C329	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C330	1-137-701-11	s	CAP, TANTALUM ELECT 4.7MF 1608
C331	1-137-701-11	s	CAP, TANTALUM ELECT 4.7MF 1608
C332	1-164-943-11	s	CAPACITOR,CHIP CERAMIC 0.01MF
C335	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
CN201	1-794-741-21	s	CONNECTOR, FFC (LIF(NON-ZIF))
CN301	1-778-162-21	s	CONNECTOR, FFC/FPC (ZIF) 14P
D102	8-719-073-01	s	DIODE MA111-(K8).S0
D201	8-719-036-83	o	DIODE RD4.3SB-T1
D202	8-719-073-01	s	DIODE MA111-(K8).S0
D203	8-719-073-01	s	DIODE MA111-(K8).S0
D301	8-719-084-08	s	DIODE MAZS0510ML
DD301	1-477-265-11		CONVERTER, DC-DC (UNIT)
FL301	1-239-352-11	s	FILTER, LOW PASS
FL302 *1	1-234-178-11	s	FILTER, BAND PASS (3.58 MHZ)
*2	1-234-150-11	s	FILTER, BAND PASS
IC101	8-752-073-11	s	IC CXA2006Q-T4
IC102	8-759-196-69	s	IC BA7655AF-E2
IC103	8-759-335-30	s	IC HD49315AFEB
IC104	8-752-381-32	s	IC CXD2480R
IC105	8-759-695-54	s	IC TC75S51FU(TE85R)
IC106	8-759-695-54	s	IC TC75S51FU(TE85R)
IC201	8-759-695-54	s	IC TC75S51FU(TE85R)
IC202	8-759-082-60	s	IC TC7S66FU
IC203	8-759-526-89	s	IC MB88347LPFV-ER
IC205	8-759-660-11	s	IC S-80830ALNP-EAT-T2
IC206	8-759-566-18	s	IC AK6480BH-E2
IC207	6-701-389-01	s	IC ICL3232CV-T
IC208	8-759-082-61	s	IC TC4W53FU
IC209	8-759-598-44	s	IC TC7WH08FK(TE85R)
IC211	8-759-058-58	s	IC TC7S04FU-TE85R
IC212	8-759-082-61	s	IC TC4W53FU
IC213	8-759-196-96	s	IC TC7SH08FU (TE85R)
IC214	8-759-710-12	s	IC NJM2230M
IC215	8-759-066-55	s	IC TA75W393FU
IC301	8-759-082-61	s	IC TC4W53FU
IC302	8-759-493-31	s	IC EL2170CW-TE2

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Ref. No. or Q'ty	Part No.	SP	Description
IC303	8-759-082-61	s	IC TC4W53FU
IC304	8-759-493-31	s	IC EL2170CW-TE2
L101	1-469-058-11	s	INDUCTOR 22UH
L102	1-469-058-11	s	INDUCTOR 22UH
L103	1-469-058-11	s	INDUCTOR 22UH
L104	1-469-058-11	s	INDUCTOR 22UH
L105	1-469-058-11	s	INDUCTOR 22UH
L106	1-469-058-11	s	INDUCTOR 22UH
L107	1-469-058-11	s	INDUCTOR 22UH
L108	1-469-058-11	s	INDUCTOR 22UH
L109	1-469-058-11	s	INDUCTOR 22UH
L110	1-469-058-11	s	INDUCTOR 22UH
L111	1-469-058-11	s	INDUCTOR 22UH
L202	1-469-058-11	s	INDUCTOR 22UH
L301	1-469-058-11	s	INDUCTOR 22UH
L302	1-414-771-91	s	INDUCTOR 10.0UH
L303	1-412-030-11	s	INDUCTOR,CHIP 22UH (3225)
L304	1-469-058-11	s	INDUCTOR 22UH
L305	1-469-058-11	s	INDUCTOR 22UH
L306	1-412-027-11	s	INDUCTOR,CHIP 2.2UH (3225)
Q101	8-729-429-68	s	TRANSISTOR 2SA1791-R
Q201	8-729-429-67	s	TRANSISTOR 2SA1791-Q
Q202	8-729-429-63	s	TRANSISTOR 2SC4656-Q
Q203	8-729-429-67	s	TRANSISTOR 2SA1791-Q
Q204	8-729-429-67	s	TRANSISTOR 2SA1791-Q
Q205	8-729-029-08	s	TRANSISTOR DTC124XUA-T106
Q206	8-729-029-06	s	TRANSISTOR DTC124EUA-T106
Q207	8-729-029-06	s	TRANSISTOR DTC124EUA-T106
Q208	8-729-029-06	s	TRANSISTOR DTC124EUA-T106
Q301	8-729-429-67	s	TRANSISTOR 2SA1791-Q
Q302	8-729-429-64	s	TRANSISTOR 2SC4565-R (0.125W)
Q303	8-729-429-64	s	TRANSISTOR 2SC4565-R (0.125W)
Q304	8-729-429-67	s	TRANSISTOR 2SA1791-Q
Q305	8-729-429-67	s	TRANSISTOR 2SA1791-Q
Q306	8-729-429-64	s	TRANSISTOR 2SC4565-R (0.125W)
Q307	8-729-429-64	s	TRANSISTOR 2SC4565-R (0.125W)
Q309	8-729-429-67	s	TRANSISTOR 2SA1791-Q
Q310	8-729-427-74	s	TRANSISTOR XP4601-TXE
Q311	8-729-429-67	s	TRANSISTOR 2SA1791-Q
Q312	8-729-429-67	s	TRANSISTOR 2SA1791-Q
Q313	8-729-429-64	s	TRANSISTOR 2SC4565-R (0.125W)
Q314	8-729-429-64	s	TRANSISTOR 2SC4565-R (0.125W)
R101	1-218-939-11	s	RESISTOR, CHIP 68 1/16W (1005)
R102	1-218-972-11	s	RESISTOR,CHIP 39K 1/16W (1005)
R103	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R104	1-208-712-11	s	RESISTOR CHIP 16K 1/16W (1005)
R105	1-218-990-11	s	RESISTOR,CHIP 0 1/16W (1005)
R106	1-218-990-11	s	RESISTOR,CHIP 0 1/16W (1005)
R107	1-218-969-11	s	RESISTOR,CHIP 22K 1/16W (1608)
R108	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R109	1-208-692-11	s	RESISTOR CHIP 2.4K 1/16W(1005)
R110	1-218-972-11	s	RESISTOR,CHIP 39K 1/16W (1005)
R111	1-218-989-11	s	RESISTOR,CHIP 1M 1/16W (1005)
R112	1-218-977-11	s	RESISTOR,CHIP 100K 1/16W(1005)
R113	1-218-964-11	s	RESISTOR, CHIP 8.2K
R114	1-218-964-11	s	RESISTOR, CHIP 8.2K
R115	1-218-964-11	s	RESISTOR, CHIP 8.2K

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Ref. No. or Q'ty	Part No.	SP	Description
R116	1-218-955-11	s	RESISTOR, CHIP 1.5K
R117	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R118	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R120	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R121	1-218-964-11	s	RESISTOR, CHIP 8.2K
R122 *1	1-218-990-11	s	RESISTOR,CHIP 0 1/16W (1005)
R123	1-218-971-11	s	RESISTOR,CHIP 33K 1/16W (1005)
R124	1-218-964-11	s	RESISTOR, CHIP 8.2K
R125	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R127	1-220-804-11	s	RESISTR,CHIP2.2M1/16W (1005)
R132 *2	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
R133	1-218-959-11	s	RESISTOR, CHIP 3.3K
R134	1-208-635-11	s	RESISTOR CHIP 10 1/16W (1005)
R135	1-218-945-11	s	RESISTOR,CHIP 220 1/16W(1005)
R136	1-218-945-11	s	RESISTOR,CHIP 220 1/16W(1005)
R137	1-208-635-11	s	RESISTOR CHIP 10 1/16W (1005)
R138	1-218-959-11	s	RESISTOR, CHIP 3.3K
R201	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
R202	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
R203	1-218-959-11	s	RESISTOR, CHIP 3.3K
R204	1-208-769-11	s	RESISTOR,CHIP 300 1/10W (2012)
R205	1-208-769-11	s	RESISTOR,CHIP 300 1/10W (2012)
R206	1-208-769-11	s	RESISTOR,CHIP 300 1/10W (2012)
R208	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R209	1-218-967-11	s	RESISTOR,CHIP 15K 1/16W (1608)
R210	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R211	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R212	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R213	1-218-977-11	s	RESISTOR,CHIP 100K 1/16W(1005)
R214	1-218-969-11	s	RESISTOR,CHIP 22K 1/16W (1608)
R215	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R216	1-218-959-11	s	RESISTOR, CHIP 3.3K
R217	1-218-959-11	s	RESISTOR, CHIP 3.3K
R218	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R219	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
R220	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R221	1-218-977-11	s	RESISTOR,CHIP 100K 1/16W(1005)
R222	1-218-969-11	s	RESISTOR,CHIP 22K 1/16W (1608)
R223	1-208-922-11	s	RESISTOR,CHIP 30K 1/16W (1005)
R224	1-218-977-11	s	RESISTOR, CHIP 100K 1/16W(1005)
R225	1-218-961-11	s	RESISTOR, CHIP 4.7K 1/16W
R226	1-208-769-11	s	RESISTOR,CHIP 300 1/10W (2012)
R227	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R228	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R229	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R230	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
R231	1-218-959-11	s	RESISTOR, CHIP 3.3K
R232	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R233	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R234	1-218-964-11	s	RESISTOR, CHIP 8.2K
R235	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R236	1-218-961-11	s	RESISTOR, CHIP 4.7K 1/16W
R237	1-218-961-11	s	RESISTOR, CHIP 4.7K 1/16W
R238 *1	1-218-970-11	s	RESISTOR CHIP 27K 1/16W (1005)
*2	1-208-922-11	s	RESISTOR,CHIP CHIP 30K 1/16W
R239	1-218-943-11	s	RESISTOR,CHIP 150 1/16W
R240	1-218-972-11	s	RESISTOR,CHIP 39K 1/16W (1005)
R241	1-218-951-11	s	RESISTOR, CHIP 680 1/16
R242	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W

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Ref. No. or Q'ty	Part No.	SP	Description
R243	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
R244	1-218-961-11	s	RESISTOR, CHIP 4.7K 1/16W
R245	1-218-989-11	s	RESISTOR,CHIP 1M 1/16W (1005)
R246	1-208-769-11	s	RESISTOR,CHIP 300 1/10W (2012)
R247	1-208-769-11	s	RESISTOR,CHIP 300 1/10W (2012)
R248	1-208-769-11	s	RESISTOR,CHIP 300 1/10W (2012)
R249	1-208-769-11	s	RESISTOR,CHIP 300 1/10W (2012)
R250	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R251	1-218-964-11	s	RESISTOR, CHIP 8.2K
R252	1-218-971-11	s	RESISTOR,CHIP 33K 1/16W (1005)
R253	1-208-695-11	s	RESISTOR CHIP 3.3K 1/16W(1005)
R254	1-208-693-11	s	RESISTOR CHIP 2.7K 1/16W(1005)
R255	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R301	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R302	1-218-948-11	s	RESISTOR CHIP 390 1/16W (1005)
R303	1-218-949-11	s	RESISTOR,CHIP 470 1/16W
R304	1-220-179-11	s	RESISTOR, CHIP 510 1/16W(1005)
R305	1-218-961-11	s	RESISTOR, CHIP 4.7K 1/16W
R306	1-218-959-11	s	RESISTOR, CHIP 3.3K
R307	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R308	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R309	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R310	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R311	1-218-954-11	s	RESISTOR, CHIP 1.2K 1/16W
R312	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R313	1-218-948-11	s	RESISTOR CHIP 390 1/16W (1005)
R314	1-220-179-11	s	RESISTOR, CHIP 510 1/16W(1005)
R315	1-218-949-11	s	RESISTOR,CHIP 470 1/16W
R316	1-218-961-11	s	RESISTOR, CHIP 4.7K 1/16W
R317	1-218-959-11	s	RESISTOR, CHIP 3.3K
R318	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R321	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R322	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R323	1-208-691-11	s	RESISTOR CHIP 2.2K 1/16W(1005)
R324	1-208-755-11	s	RESISTOR,CHIP 75 1/10W (2012)
R325	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R326	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R327	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R328	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R329	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R330	1-218-957-11	s	RESISTOR,CHIP 2.2K 1/16W(1608)
R331	1-218-948-11	s	RESISTOR CHIP 390 1/16W (1005)
R332	1-218-948-11	s	RESISTOR CHIP 390 1/16W (1005)
R333	1-220-179-11	s	RESISTOR, CHIP 510 1/16W(1005)
R334	1-218-949-11	s	RESISTOR,CHIP 470 1/16W
R335	1-218-961-11	s	RESISTOR, CHIP 4.7K 1/16W
R336	1-218-959-11	s	RESISTOR, CHIP 3.3K
R337	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
R340	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R341	1-218-953-11	s	RESISTOR, CHIP 1K 1/16W
R342	1-208-894-11	s	RESISTOR,CHIP 2.0K 1/16W(1005)
R343	1-208-755-11	s	RESISTOR,CHIP 75 1/10W (2012)
R344	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R345	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R346	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R347	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R348	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R349	1-218-973-11	s	RESISTOR,CHIP 47K 1/16W (1005)
R350	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W

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Ref. No. or Q'ty	Part No.	SP	Description
R351	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
R352	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
R353	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
R355	1-218-960-11	s	RESISTOR, CHIP 3.9K 1/16W
R356	1-218-965-11	s	RESISTOR, CHIP 10K 1/16W
RV301	1-225-792-21	s	RES, ADJ, CERMET 10K
RV302	1-225-792-21	s	RES, ADJ, CERMET 10K
S302	1-692-271-31	s	SWITCH, SLIDE
X101 *1	1-767-618-11	s	OSCILLATOR, CRYSTAL
*2	1-767-620-11	s	OSCILLATOR, CRYSTAL
X102 *1	1-767-617-11	s	OSCILLATOR, CRYSTAL
*2	1-767-619-11	s	OSCILLATOR, CRYSTAL
X103	1-781-284-11	s	VIBRATOR, CRYSTAL

CN-2269 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8344-503-A	s	MOUNTED CIRCUIT BOARD, CN-2269
C401	1-115-416-11	s	CAPACITOR,CERAMIC 1000PF/25V
C402	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C403	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C404	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C405	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C406	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C407	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C408	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C409	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C410	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C411	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C412	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C413	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C414	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
C415	1-164-858-11	s	CAPACITOR,CERAMIC 22PF/16V
D401	8-719-510-11	s	DIODE D1FS4
F401	1-533-380-21	s	FUSE, CHIP 1A (6125)
L401	1-412-026-11	s	INDUCTOR,CHIP 1UH (3225)
L402	1-412-981-11	s	INDUCTOR (SMALL TYPE)
L403	1-412-981-11	s	INDUCTOR (SMALL TYPE)
L404	1-412-981-11	s	INDUCTOR (SMALL TYPE)
L405	1-412-981-11	s	INDUCTOR (SMALL TYPE)
L406	1-412-981-11	s	INDUCTOR (SMALL TYPE)
L407	1-412-981-11	s	INDUCTOR (SMALL TYPE)
L408	1-412-981-11	s	INDUCTOR (SMALL TYPE)
R401	1-218-990-11	s	RESISTOR,CHIP 0 1/16W (1005)
TP401	1-535-757-11	s	CHIP, CHECKER (CONNECTOR)

4-4. Frame

FRAME

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-691-410-21	s	CONNECTOR, ROUND TYPE 12P
1pc	1-547-381-12	s	FILTER BLOCK, OPTICAL

4-5. Packing Materials & Supplied Accessories

PACKING MATERIALS & SUPPLIED ACCESSORIES

Ref. No. or Q'ty	Part No.	SP	Description
1pc	X-3166-471-3	o	HOLDER (A) ASSY, CAMERA
1pc	X-3166-472-1	o	HOLDER (B) ASSY, CAMERA
2pcs	3-174-632-01	s	SCREW, TERMINAL (ST)
1pc	3-206-581-01	s	OPERATING INSTRUCTIONS

Section 5
Semiconductor Pin Assignments

The following describes the semiconductor types used in this unit.
For semiconductors marked with page numbers in the index, refer to the corresponding pages in this section. However, in some cases incompatible types are also listed, therefore, when a part is to be replaced, also refer to the Spare Parts section.
In addition, for semiconductors with ID Nos., refer to the separate CD-ROM titled "Semiconductor Pin Assignments" (Sony Part No. 9-968-546-xx) that allows searching for parts by semiconductor type or ID No.
The semiconductors in the manual or on the CD-ROM are listed by equivalent types. Thus the external view or the index mark indication may differ from the actual type.
Pin assignments and block diagrams are based on the IC manufacturer's data book.

本機に使用されている半導体型名の一覧を下記に示します。
索引中，ページが記載されている半導体は，本章の該当ページを参照してください。ただし，互換性のない型名を併記している場合がありますので，部品を交換するときは，Spare Partsの章を参照してください。
また，ID番号が記載されている半導体は，別途発行の "Semiconductor Pin Assignments" CD-ROM版 (ソニー部品番号：9-968-546-xx)を参照してください。
半導体型名またはID番号から検索ができます。
マニュアルまたはCD-ROMに掲載されている半導体は，それぞれの機能を等価的に表わしたものです。
外観やインデックスマークの表示方法が実物と異なる場合があります。
ピン配置およびブロック図はICメーカーのデータブックに従いました。

DIODE	Page or ID No.
D1FS4	DC007-01
D1FS4-TB	DC007-01
MA111-(K8).S0	DC008-01
MA111-TX	DC008-01
MAZS0510ML	DC008-02
RD4.3SB-T1	DC008-04

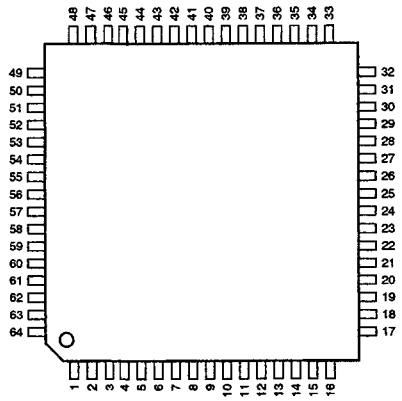
TRANSISTOR	Page or ID No.
2SA1791-(TX)-Q	TC001-01
2SA1791-(TX)-R	TC001-01
2SA1791-Q	TC001-01
2SA1791-R	TC001-01
2SC4565-R(0.125W)	TC001-02
2SC4656-(TX)-Q	TC001-02
2SC4656-(TX)-R	TC001-02
2SC4656-Q	TC001-02
2SK711-BL	TC001-05
2SK711-BL/V-TE85L	TC001-05
DTC124EUA-T106	TC001-03
XP4601-TXE	TC006-08

IC	Page or ID No.
AK6480BH-E2	5-3
BA7655AF-E2	BA7655AF
CXA2006Q-T4	CXA2006Q
CXD2480R	CXD2480R
CXD2480R-T4	CXD2480R
EL2170CW-TE2	EL2170CW
HD49315AFEB	HD49315AFEB
HD64F3664FP	5-2
ICL3232CV-T	5-3
MB88347LPFV-ER	MB88347PFV-G-BND
NJM2230M	NJM2230M
NJM2230M(TE2)	NJM2230M
S-80830ALNP-EAT-T2	S-80823ALNP-EAL-T2
TA75W393FU	TA75W393FU
TA75W393FU-TE12R	TA75W393FU
TC4W53FU	TC4W53FU
TC4W53FU(TE12R)	TC4W53FU
TC75S51FU(TE85R)	TC75W51FU-TE12R
TC7S04FU(TE85R)	TC7S04F
TC7S04FU-TE85R	TC7S04F
TC7S66FU	SC14S66F
TC7S66FU(TE85R)	SC14S66F
TC7SH08FU(TE85R)	TC7S08F
TC7SH08FU-TE85R	TC7S08F
TC7WH08FK(TE85R)	TC7W08F

IC

HD64F3664FP (HITACHI)

16-BIT MICROCOMPUTER
—TOP VIEW—



PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	—	NC	17	—	NC	33	—	NC	49	—	NC
2	—	NC	18	—	NC	34	—	NC	50	—	NC
3	I	A.Vcc	19	I/O	P52/WKP2	35	I	NMI	51	I/O	P14/IRQ0
4	O	X2	20	I/O	P53/WKP3	36	I/O	P80/FTCI	52	I/O	P15/IRQ1
5	I	X1	21	I/O	P54/WKP4	37	I/O	P81/FTIOA	53	I/O	P16/IRQ2
6	I	Vcl	22	I/O	P55/WKP5/ADTRG	38	I/O	P82/FTIOB	54	I/O	P17/IRQ3/TRGV
7	I	RES	23	I/O	P10/TMOW	39	I/O	P83/FTIOC	55	I	PB4/AN4
8	I	TEST	24	I/O	P11	40	I/O	P84/FTIOD	56	I	PB5/AN5
9	I	GND	25	I/O	P12	41	I/O	P85	57	I	PB6/AN6
10	O	OSC2	26	I/O	P56/SDA	42	I/O	P86	58	I	PB7/AN7
11	I	OSC1	27	I/O	P57/SCL	43	I/O	P87	59	I	PB3/AN3
12	I	Vcc	28	I/O	P74/TMRIV	44	I/O	P20/SCK3	60	I	PB2/AN2
13	I/O	P50/WKP0	29	I/O	P75/TMCIV	45	I/O	P21/RXD	61	I	PB1/AN1
14	I/O	P51/WKP1	30	I/O	P76/TMOV	46	I/O	P22/TXD	62	I	PB0/AN0
15	—	NC	31	—	NC	47	—	NC	63	—	NC
16	—	NC	32	—	NC	48	—	NC	64	—	NC

INPUTS

ADTRG	: A/D CONVERTER TRIGGER
AN0 - AN7	: ANALOG SIGNAL
FTCI	: TIMER W, EVENT CLOCK
IRQ0 - IRQ3	: EXTERNAL INTERRUPT REQUEST
NMI	: NON-MASKABLE INTERRUPT REQUEST
OSC1	: SYSTEM CLOCK IN/OSCILLATOR CONNECTION
PB0 - PB7	: PORT B
RES	: RESET
RXD	: SERIAL COMMUNICATION INTERFACE RECEIVE DATA
TEST	: TEST
TMCIV	: TIMER V, EVENT CLOCK
TMRIV	: TIMER V, COUNTER RESET
TRGV	: TIMER V, COUNTER START TRIGGER
WKP0 - WKP5	: EXTERNAL INTERRUPT REQUEST
X1	: SUB CLOCK IN/CRYSTAL OSCILLATOR CONNECTION

OUTPUTS

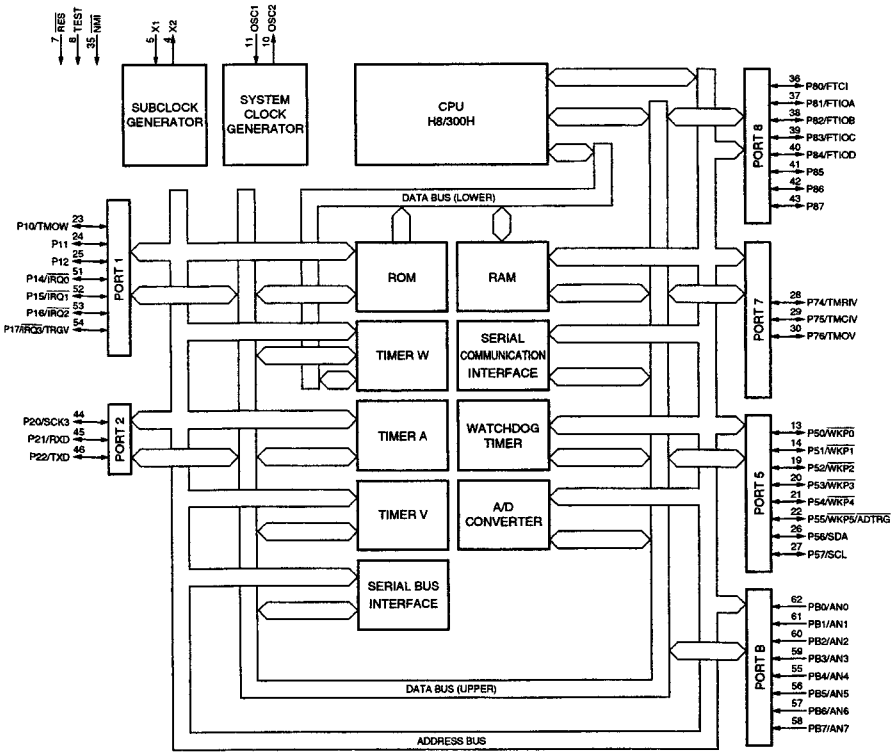
OSC2	: SYSTEM CLOCK OUT/OSCILLATOR CONNECTION
SCK3	: SERIAL COMMUNICATION INTERFACE CLOCK
TMOV	: TIMER V, WAVEFORM OUT, GENERATED BY OUTPUT COMPARE FUNCTION
TMOW	: TIMER A, DIVIDED CLOCK
TXD	: SERIAL COMMUNICATION INTERFACE TRANSMIT DATA
X2	: SUB CLOCK OUT/CRYSTAL OSCILLATOR CONNECTION

INPUTS/OUTPUTS

FTIOA - FTIOD	: TIMER W, OUTPUT COMPARE OUT/INPUT CAPTURE IN/PWM OUT
P10 - P12, P14 - P17	: PORT 1
P20 - P22	: PORT 2
P50 - P57	: PORT 5
P74 - P76	: PORT 7
P80 - P87	: PORT 8
SCL	: SERIAL BUS INTERFACE CLOCK
SDA	: SERIAL BUS INTERFACE DATA

OTHER

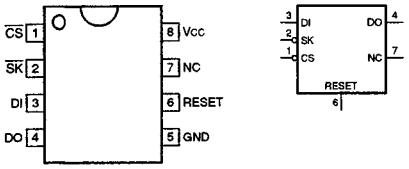
NC	: NO CONNECTION



AK6480BH-E2 (ASAHI)

8 K (512 x 16)-BIT SERIAL EEPROM

—TOP VIEW—



INPUTS

$\overline{CS}$: CHIP SELECT
DI : SERIAL DATA
RESET : RESET
$\overline{SK}$: SERIAL CLOCK

OUTPUT

DO : SERIAL DATA

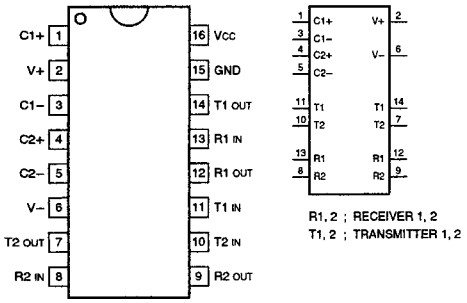
OTHER

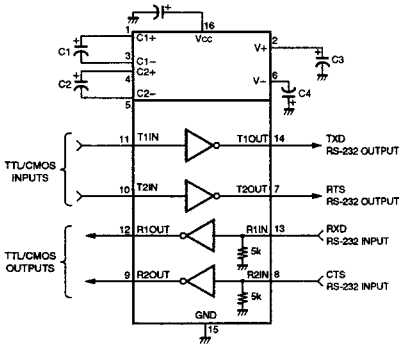
NC : NO CONNECTION

ICL3232CV-T (INTERSIL)

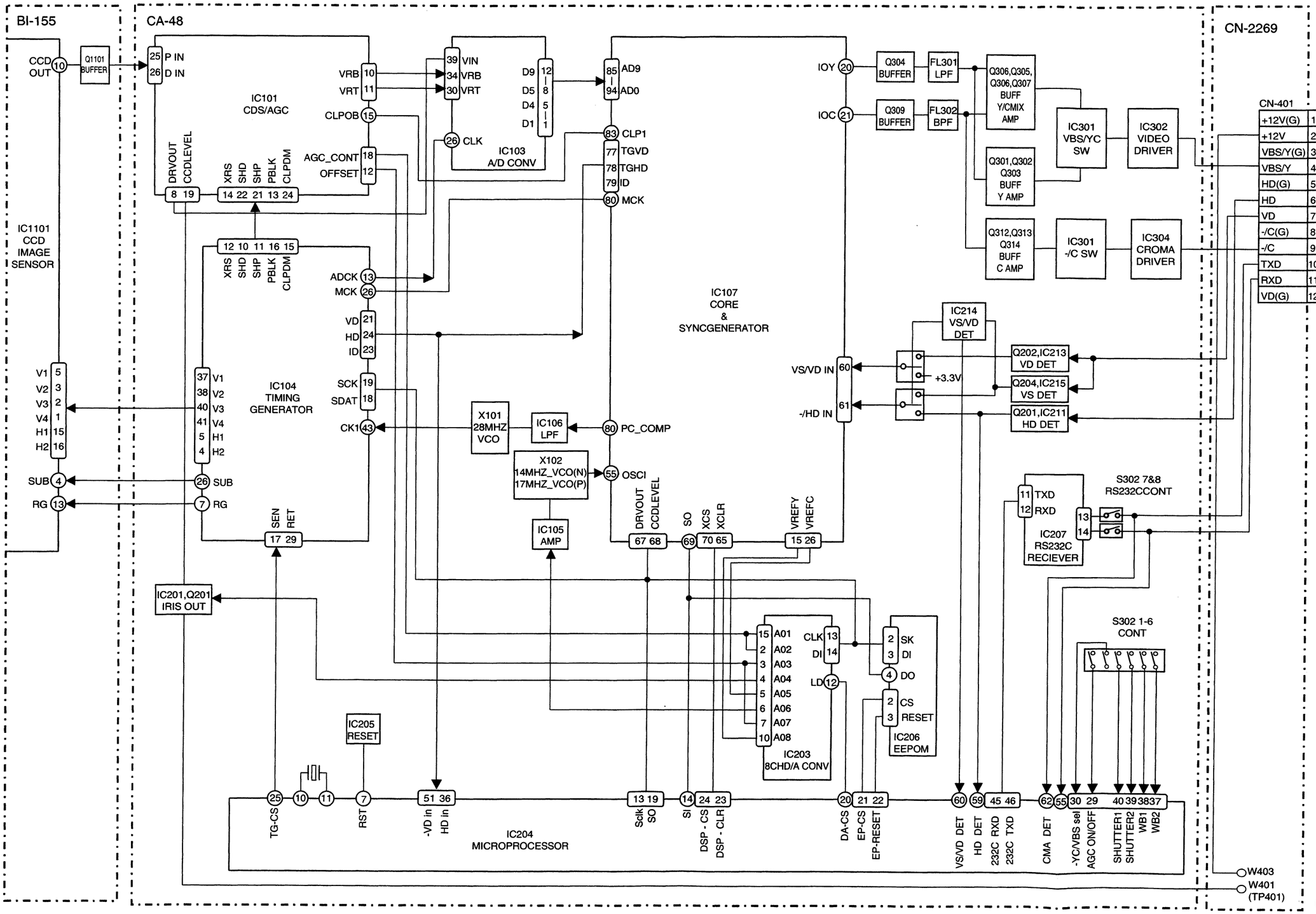
RS-232 TRANSMITTER/RECEIVER

—TOP VIEW—



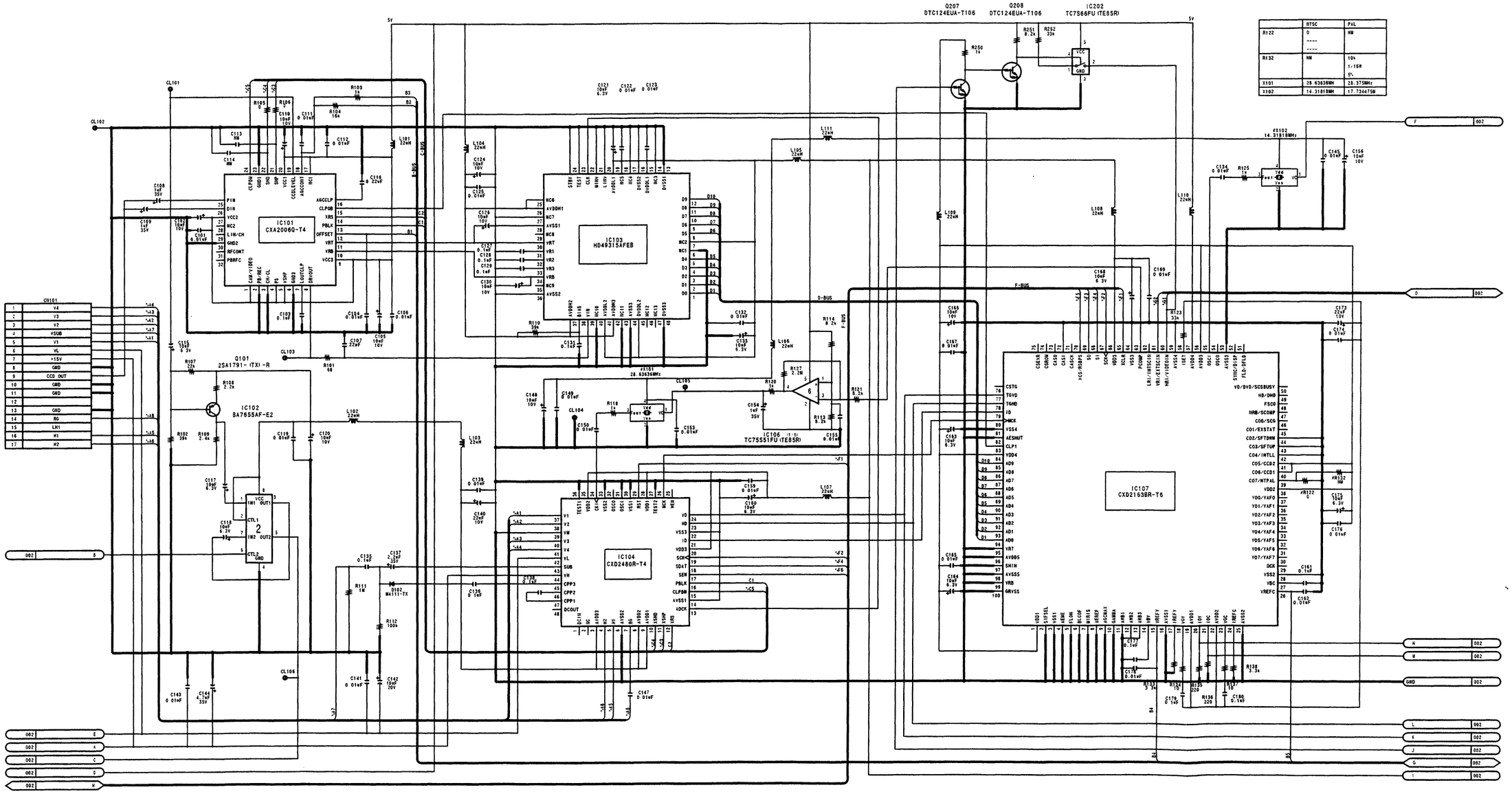


Section 6
Block Diagrams

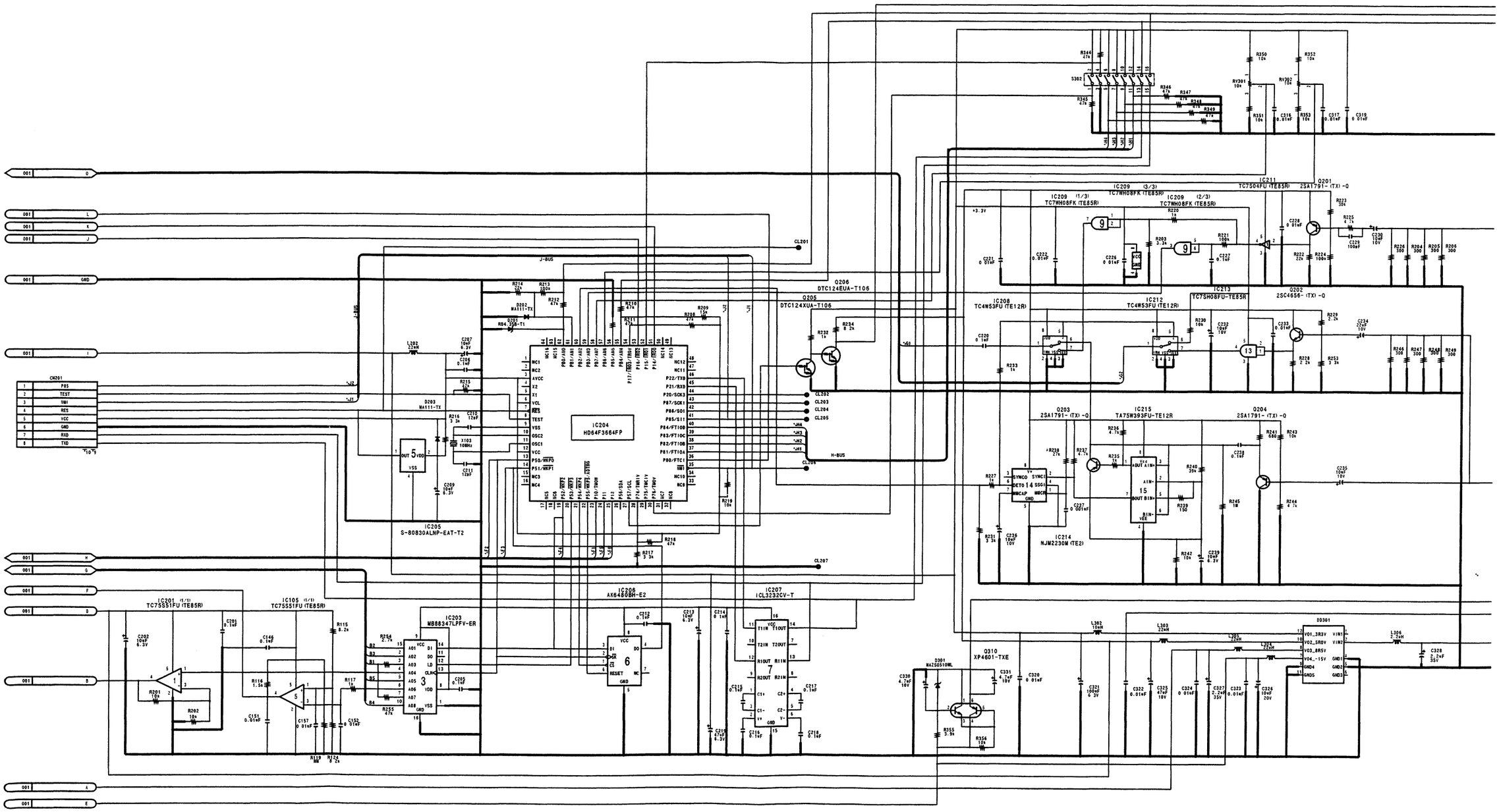


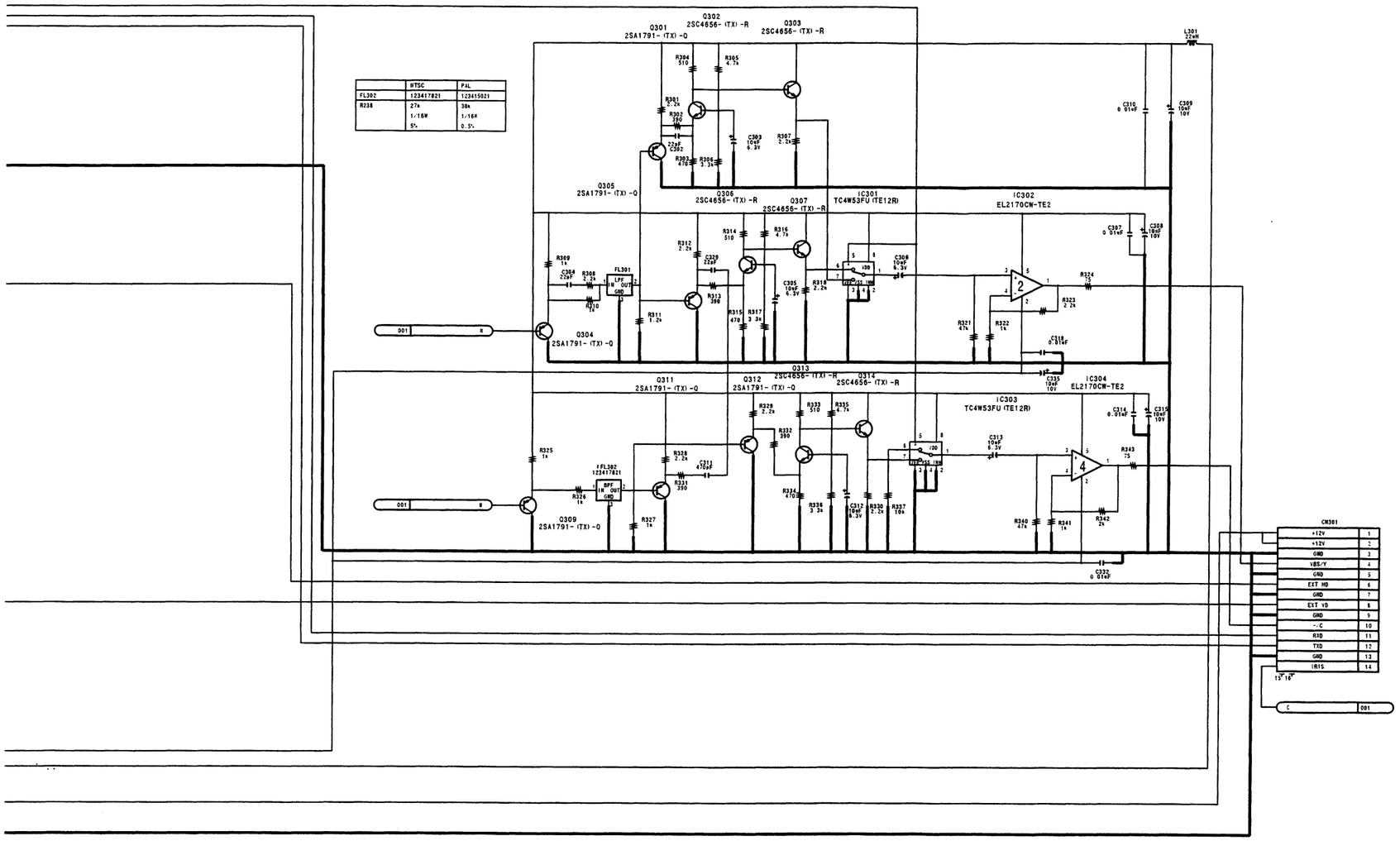
Overall

Section 7
Schematic Diagrams



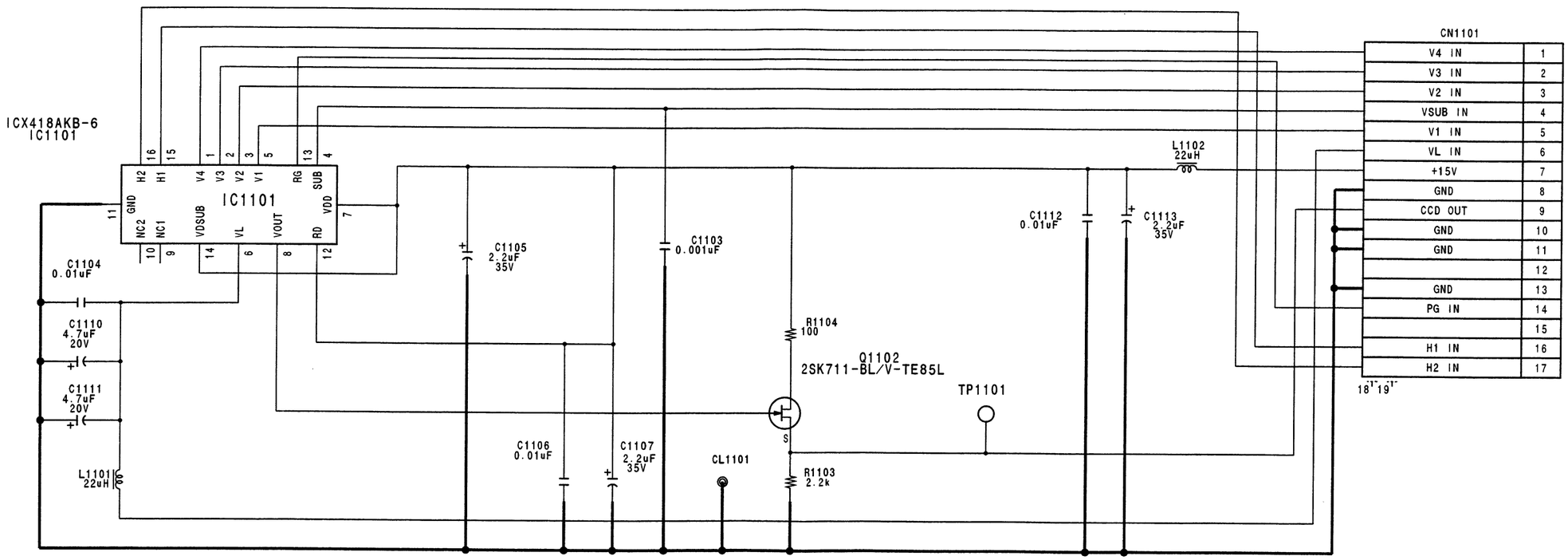
	NTSC	PAL
R122	0	NM
R132	NM	10k 1/16W 5%
X101	28.63636MH	28.375MHz
X102	14.31818MH	17.734475M


CN201
IC204 HD64F3664FP
IC205 S-80830ALNP-EAT-T2
IC201 (1/3) TC75S51FU (TE85R)
IC105 (1/3) TC75S51FU (TE85R)
IC203 MB88347LPFV-ER
IC206 AK6480BH-E2
IC207 ICL3232CV-T
IC208 TC4W53FU (TE12R)
IC209 (1/3) TC7WH08FK (TE85R)
IC209 (2/3) TC7WH08FK (TE85R)
IC209 (3/3) TC7WH08FK (TE85R)
IC211 TC7S04FU (TE85R)
IC212 TC4W53FU (TE12R)
IC213 TC7SH08FU-TE85R
IC214 NJM2230M (TE2)
IC215 TA75W393FU-TE12R
Q201 2SA1791- (TX) -Q
Q202 2SC4656- (TX) -Q
Q203 2SA1791- (TX) -Q
Q204 2SA1791- (TX) -Q
Q205 DTC124XUA-T106
Q206 DTC124EUA-T106
Q310 XP4601-TXE
J-BUS
H-BUS
CL201
CL202
CL203
CL204
CL205
CL206
CL207
CL209
S302
RV301 10k
RV302 10k
D201 RD4.3SB-T1
D202 MA111-TX
D203 MA111-TX
D301 MAZS0510ML
X103 10MHz
L302 10nH
L303 22nH
L305 2.2nH
L306 2.2nH
DD301



	WTSC	PAL
FL302	12341782I	12341502I
R238	27k 1/16W 5%	39k 1/16W 0.5%

	NTSC	PAL
IC1101	ICX418AKB-	ICX419AKB-



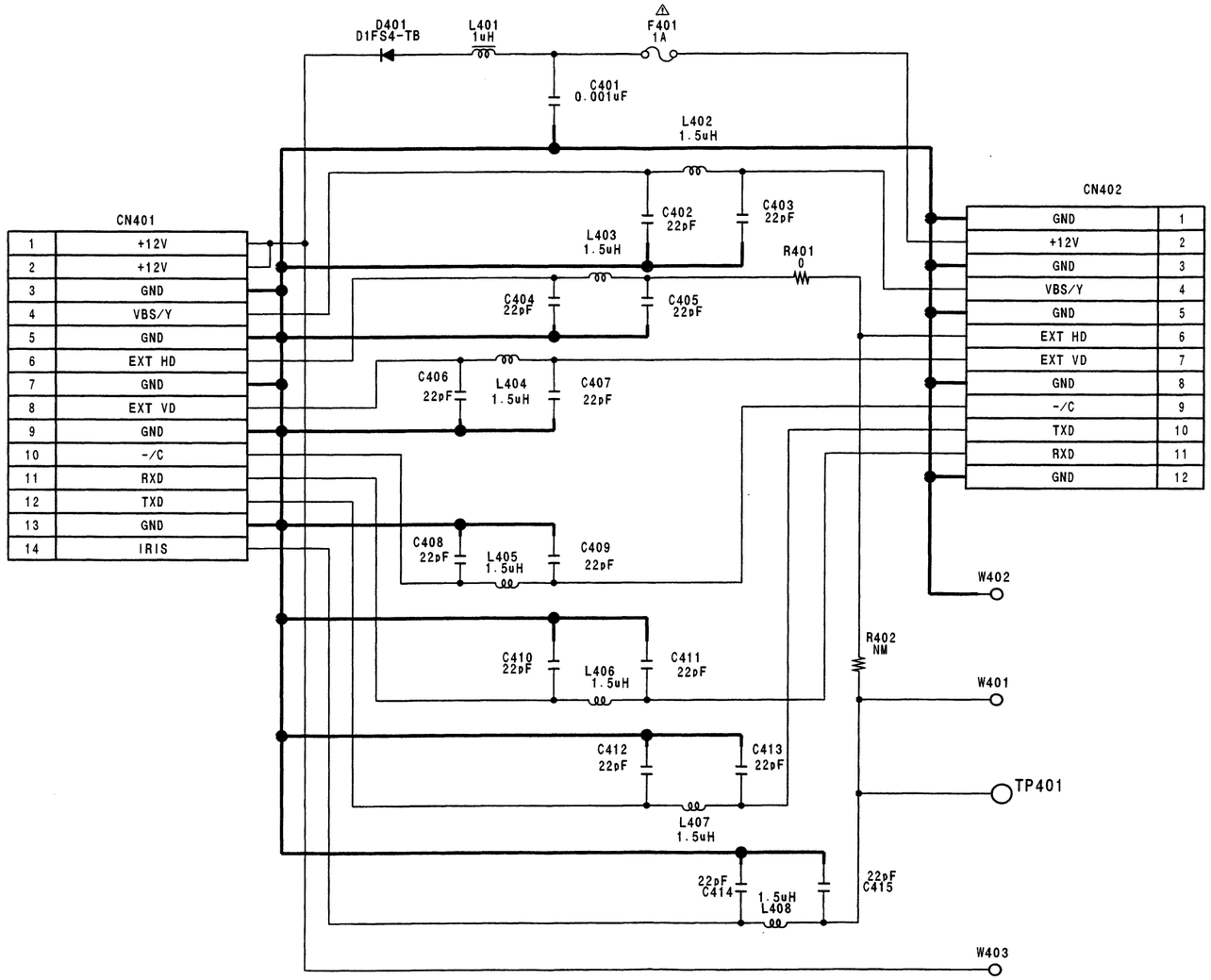
BI-155

7-4 7-4

XC-555/P: English

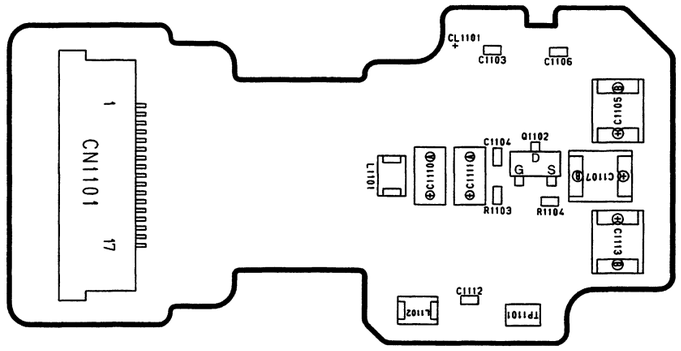
A | B | C | D | E | F | G | H

SP1644 / Druck 6

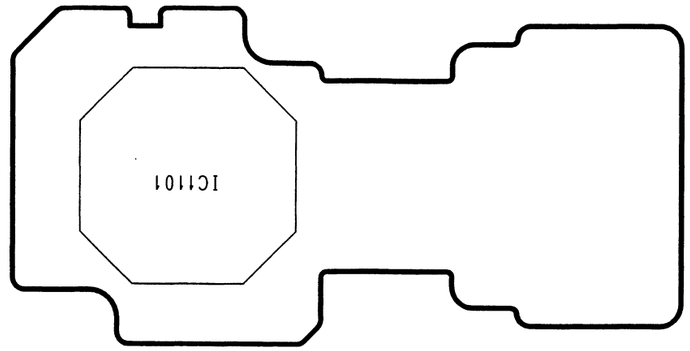

D401
D1FS4-TB
L401
1uH
F401
1A
C401
0.001uF
L402
1.5uH
CN401
1 +12V
2 +12V
3 GND
4 VBS/Y
5 GND
6 EXT HD
7 GND
8 EXT VD
9 GND
10 -/C
11 RXD
12 TXD
13 GND
14 IRIS
C402
22pF
C403
22pF
L403
1.5uH
R401
0
C404
22pF
C405
22pF
C406
22pF
L404
1.5uH
C407
22pF
C408
22pF
L405
1.5uH
C409
22pF
C410
22pF
L406
1.5uH
C411
22pF
C412
22pF
C413
22pF
L407
1.5uH
22pF
C414
1.5uH
L408
22pF
C415
R402
NM
CN402
GND 1
+12V 2
GND 3
VBS/Y 4
GND 5
EXT HD 6
EXT VD 7
GND 8
-/C 9
TXD 10
RXD 11
GND 12
W402
W401
TP401
W403

CN-2269

Section 8
Board Layouts



BI-115 -A SIDE-
SUFFIX: -11



BI-115 -B SIDE-
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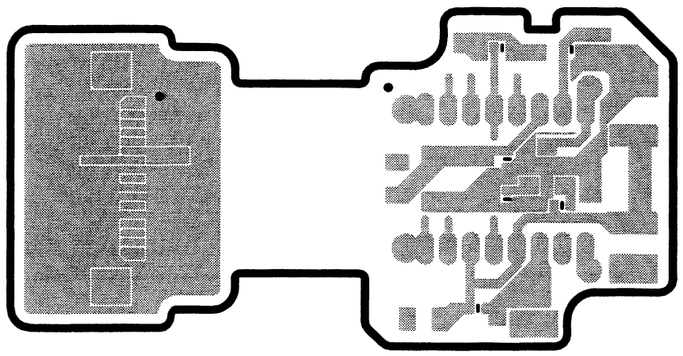

BI-115 -A SIDE-
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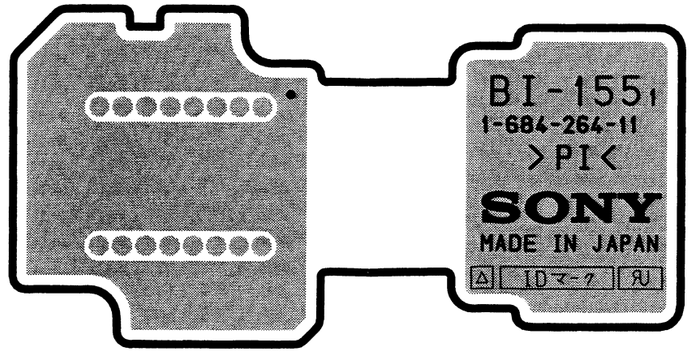

BI-115 -B SIDE-
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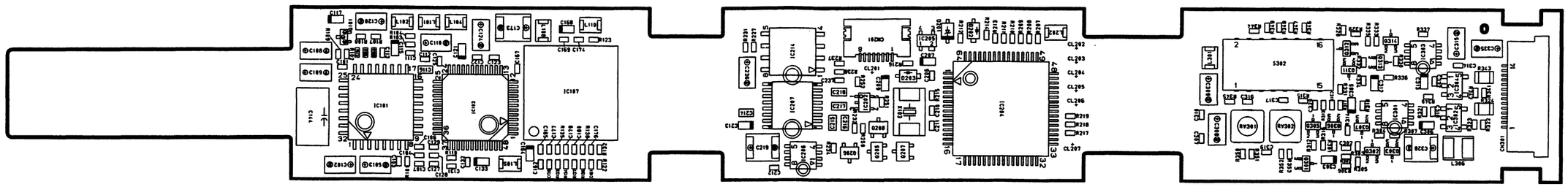

CA-48 -A SIDE-
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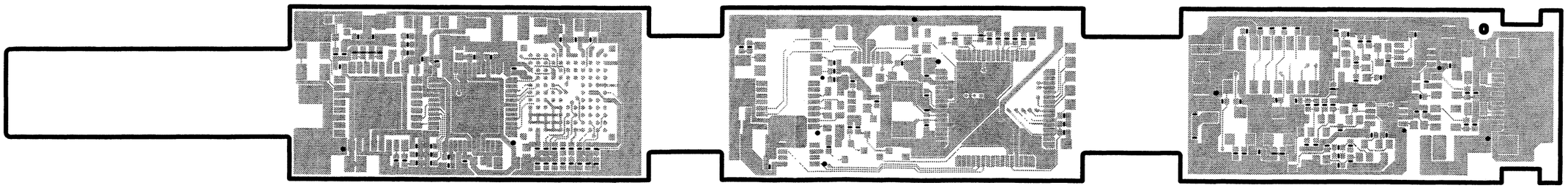

CA-48 -A SIDE-
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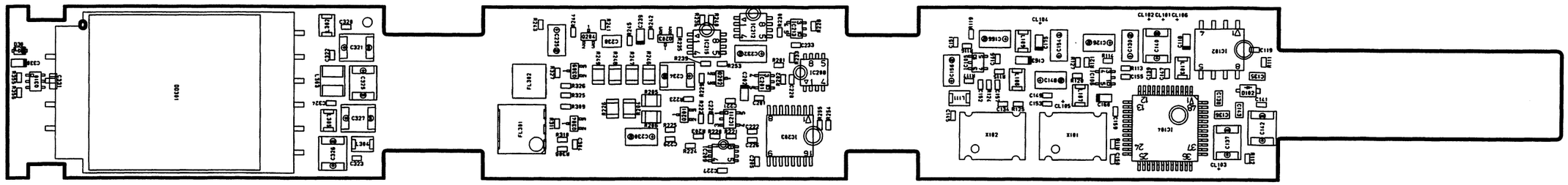

CA-48 -B SIDE-
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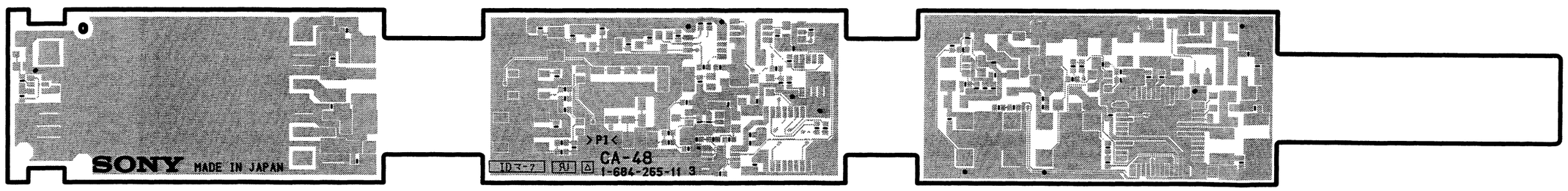

CA-48 -B SIDE-
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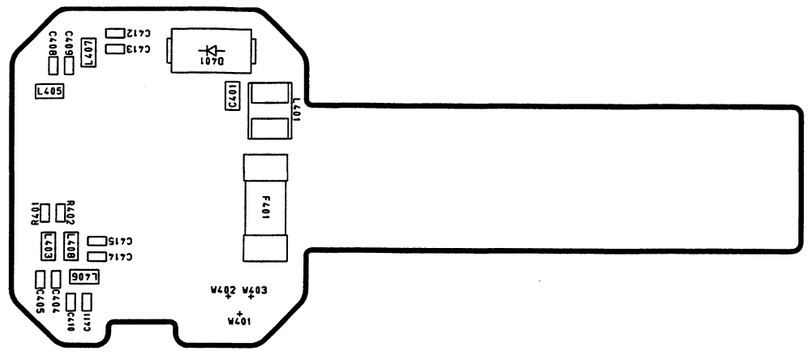
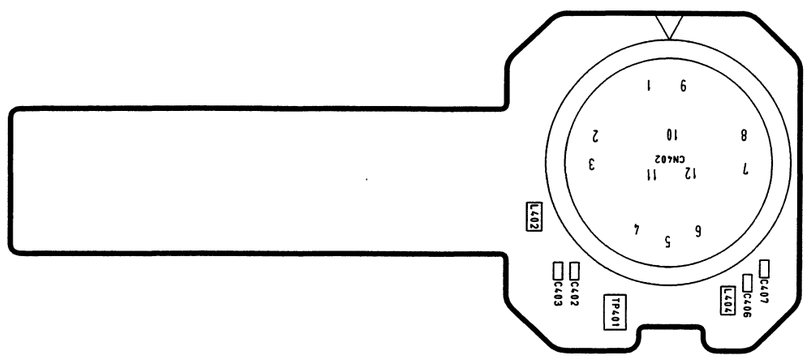
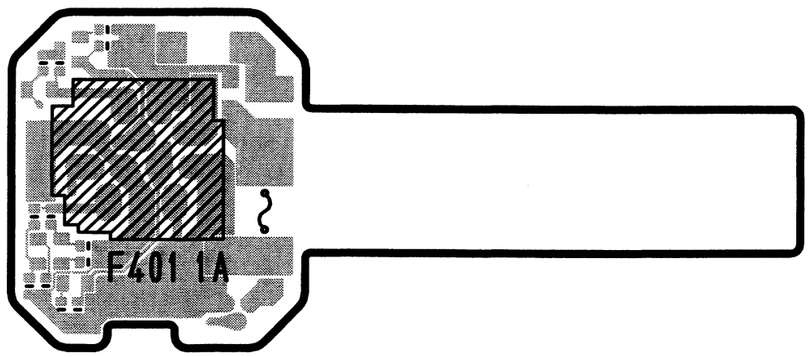


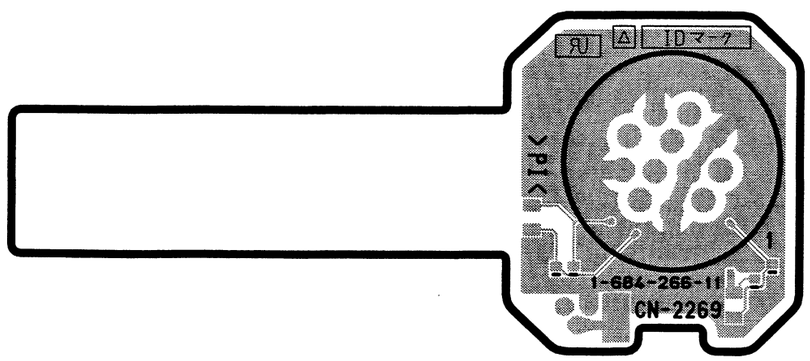
CN-2269 -A SIDE-
SUFFIX: -11



CN-2269 -B SIDE-
SUFFIX: -11



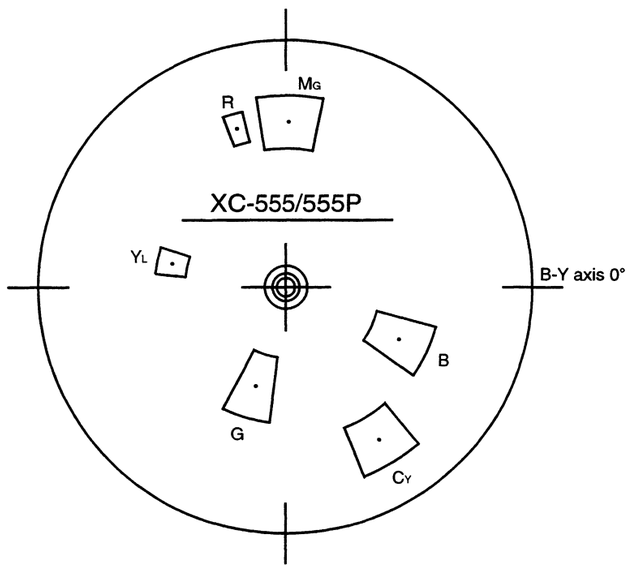
CN-2269 -A SIDE-
SUFFIX: -11



CN-2269 -B SIDE-
SUFFIX: -11

VECTORSCOPE SCALE

OHPシートにコピーしてください。
Copy on a transparent sheet.



SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

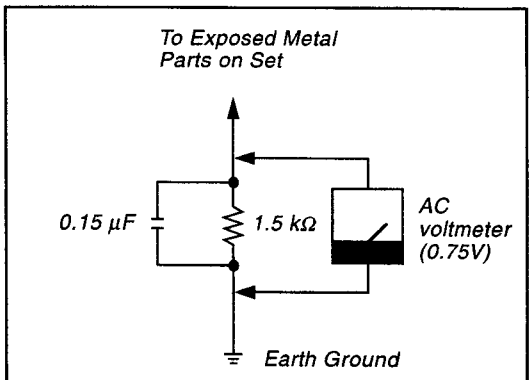


Fig A. Using an AC voltmeter to check AC leakage.